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The aim of this guide is to aid sixth-grade teachers whose classes participate in the San Diego City and County outdoor education programs. The guide enables the teacher to improve the quality of outdoor education through suggestions for better planning and preparation procedures for the camping experience and for more active student participation during the encampment itself. Ways and means are enumerated by which the outdoor education experience may be extended to add vitality, understanding, and new interests to the regular classroom instructional program. The utilization of a "camp kit," consisting of pictures, maps, pamphlets, and books, in preparation for the outdoor experience, is also described. A related document is RC 003 275. (DA)

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TEACHERS' GUIDE TO OUTDOOR EDUCATION
GRADE VI

San Diego City Schools
San Diego, California
1959
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OFFICE OF EDUCATION

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TEACHERS' GUIDE TO OUTDOOR EDUCATION

Grade VI

Prepared by

Denver C. Fox

At the Request of the

Joint Outdoor Education Advisory Committee for 1966-67

Consultant Committee

J. Fred Wilson
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Approved by the Board of Education

San Diego City Schools
San Diego, California

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Unedited

PREFACE

The general aim of this guide is to aid teachers of sixth grade boys and girls who participate in the San Diego city and county outdoor education program.

The guide is designed to enable the classroom teacher to improve the quality of the outdoor experience through better planning and preparation for the encampment, to help the teacher participate effectively in the outdoor program, and to suggest ways and means of using the outdoor experiences to add vitality, understanding and new interests to the regular classroom instructional program.

This guide does not attempt to describe in detail the program at the camps. Such descriptions are contained in _Outdoor Education: A Guide to the Instructional Program at the Sixth-Grade School Camps_, written expressly for the camp teacher. However, each sixth grade teacher should become familiar with the camp teacher's guide and use it for reference in planning for the outdoor experience.

The classroom teacher should also plan to use the "camp kit" which contains a collection of pictures, pamphlets, maps and books related to the outdoor experience. The camp kit will be delivered to each school approximately two weeks before its encampment.

Appreciation is expressed to the hundreds of sixth-grade teachers who have contributed to the development of this guide.

George V. Hall

George V. Hall
Associate Superintendent
Operation of Schools

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I

WHAT IS THE OUTDOOR EDUCATION PROGRAM?

Outdoor education programs were initiated in school districts in San Diego County in 1946 under the leadership of the Joint Camping Education Steering Committee now known as the Outdoor Education Advisory Committee. The membership of this advisory committee is representative of the districts participating in outdoor education programs.

This guide contains the types of materials developed by the advisory committee. The committee develops statements of policy, standards and practice that are acceptable to all participating districts. Each district then uses the committee's guidance in the best interests of its own outdoor education program.

SCOPE OF THE OUTDOOR EDUCATION PROGRAM

In general, a district's program includes not only the experiences at camp, but also the related pre-camp and post-camp experiences in the classroom. The point of view of the advisory committee is that "the outdoor education must contribute more to the school program than a week of outstanding experiences and learnings at camp. The great potential of outdoor education will not be fully realized until the impact of the increased interest and understanding associated with the first-hand experience is brought to bear directly upon the classroom program of instruction. The outdoor education program can charge the classroom program with vitality and the pupils and teachers with enthusiasm that will result in an upgrading of instruction."

The San Diego Unified School District has provided leadership in relating the outdoor experience effectively to the classroom instruction program. One example of school-camp integration is the development of a social studies unit on conservation. The school encampments are scheduled so that pupils go to camp while they are involved in the social studies conservation unit. Similar integration of school and camp is found in all other subject areas of the sixth grade curriculum.

EXPERIENCES INCLUDED IN THE OUTDOOR PROGRAM

The outdoor program is described in detail in *Outdoor Education: A Guide to the Instructional Program at the Sixth-Grade School Camps.* A brief overview of experiences included in the outdoor program is presented in the following outline.

1. EXPERIENCES IN NATURAL SCIENCES

   A. The heavens

      1. Studying the stars and going on night hikes
         a. Finding constellations using portable planetariums
         b. Learning legends about the constellations
         c. Observing the planets, moon and stars through telescopes
         d. Studying sun spots projected by telescopes
      2. Studying telescopes and their uses
      3. Visiting an observatory and museum
      4. Learning to use stars to determine direction
      5. Viewing films about astronomy
      6. Experimenting with light
         a. Reflecting with mirrors
         b. Focusing with lenses
         c. Observing with smoke chamber

The Palomar Observatory

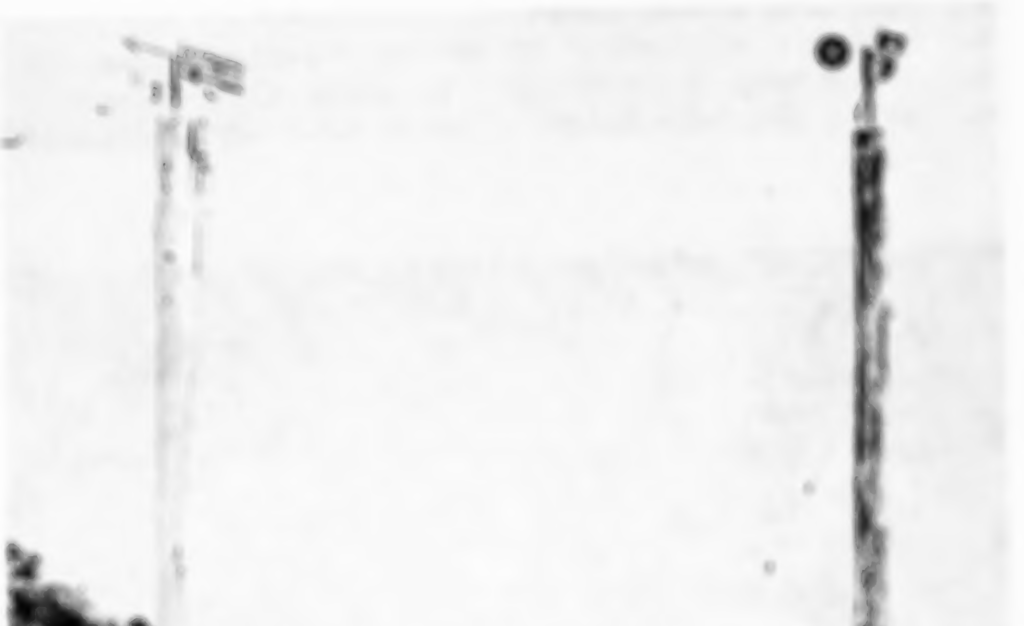
B. Weather and Climate

1. Discussing the importance of weather to the outdoor environment, plants, animals, students

2. Using the camp weather station to observe, measure, record, report, predict

3. Discussing clouds, rain cycle, wind

4. Developing a "fire hazard index" to determine if activities such as cookouts, campfires, and burning can be carried on safely



Studying the weather at camp

C. Rocks and minerals

1. Studying the geological history of the mountain area

    a. Examining roadcuts, kinds of rocks
    b. Developing an exhibit of local rocks and telling the story of their origin

2. Discussing how the soil has been formed and studying soil profiles

3. Learning the mineral resources of the camp area

    a. Visiting nearby mines
    b. Making a collection of mineral-bearing rocks
    c. Using camp "mineralight" to study fluorescence
    d. Using the camp Geiger counter to study radioactivity

Panning scheelite ore in the stream

D. The topography of the land

   1. Observing mountains, valleys, ridges, watersheds, divides, mesas, buttes, terraces

   2. Discussing formation, function, effect, and characteristics of land forms

   3. Studying problems of the land

E. Water

   1. Identifying the source of water found near camp--rain, streams, lakes, reservoirs, wells, springs

   2. Discussing the importance of water and man's responsibility for protecting the watershed

   3. Discussing the importance of the local area as one of the sources of water supply for farms and cities.

   4. Tracing the camp water supply

   5. Observing the work of water

F. Living things

   1. Investigating the many interrelationships and interdependencies of living things

      a. Dependency upon basic resources: soil, air, sunlight, water
      b. Carbon dioxide cycle, photosynthesis, food chains

   2. Studying the ecology of living things

   3. Learning about characteristics and functions of the different kinds of plants, insects, birds, and animals observed

   4. Using instruments and equipment in the camp science laboratory

   5. Discussing man's relationship to his natural environment and his responsibility for wise use of the resources so abundantly provided

   6. Learning how the Indians made use of their environment

Exploring a cave on an old Indian campsite

II. EXPERIENCES IN CONSERVING NATURAL RESOURCES

A. Hiking to explore and observe natural resources

B. Listening to nature talks

C. Studying nature and exhibits in the camp museum

D. Learning and abiding by rules and regulations of the State park system and United States Forest Service

E. Practicing good conservation procedures--good sanitation in forests, streams and lakes, picking up litter

F. Using natural resources wisely--following good thrift and conservation principles in collecting craft materials

G. Working to improve and conserve natural resources

1. Controlling soil erosion:

   a. Wattling
   b. Building dams, retaining walls, diversion berms, gully plugs and rock aprons

2. Collecting and propagating seeds; nursery work

3. Collecting "wildlings" (wild seedlings) for transplanting

4. Planting of seedlings: potted and/or bare root stock

5. Providing fire protection

   a. Clearing debris and grass from danger spots
   b. Learning and practicing good fire prevention and suppression techniques in cookouts and slash-burning operations
   c. Reducing fire hazard by removing "slash" (limbs) and "duff" (leaves) from ground cover
   d. Removing snags that attract lightning
   e. Pruning dead limbs from trees and chaparral
   f. Improving firetruck trails

6. Improving timber stands

   a. Thinning dense stands
   b. Removing "weed" trees
   c. Pruning mistletoe

7. Improving grazing land--clearing land of debris so that grass may grow

8. Working on beetle control projects--cutting, limbing and treating trees to kill beetles

9. Helping to make bird and animal surveys

10. Feeding wildlife in heavy snows

11. Providing watering areas for wildlife

12. Developing and maintaining trails

III. WORK EXPERIENCES

A. As a part of the camping activity

   1. Cleaning cabins, activity rooms, campgrounds

   2. Washing dishes and setting tables

B. As an effort to improve the camp program

   1. Constructing bridges, retaining walls, council meeting area, weather stations

   2. Fireproffing high-hazard areas

   3. Collecting special craft materials

C. As an effort to improve the forest environment--working on conservation projects (See section on conservation experiences.)

IV. SOCIAL LIVING EXPERIENCES

Girls relaxing outside their cabins

A. As a member of cabin groups living together 24 hours a day--rest period, showers, cabin cleanup, planning, sharing, evaluating

B. As members of activity groups--square and folk dancing, dramatics, games, stunts

C. As members of the total camp group-- activity meetings, evening programs, free choice and games periods, group singing of camp songs

V. ARTS AND CRAFTS EXPERIENCES

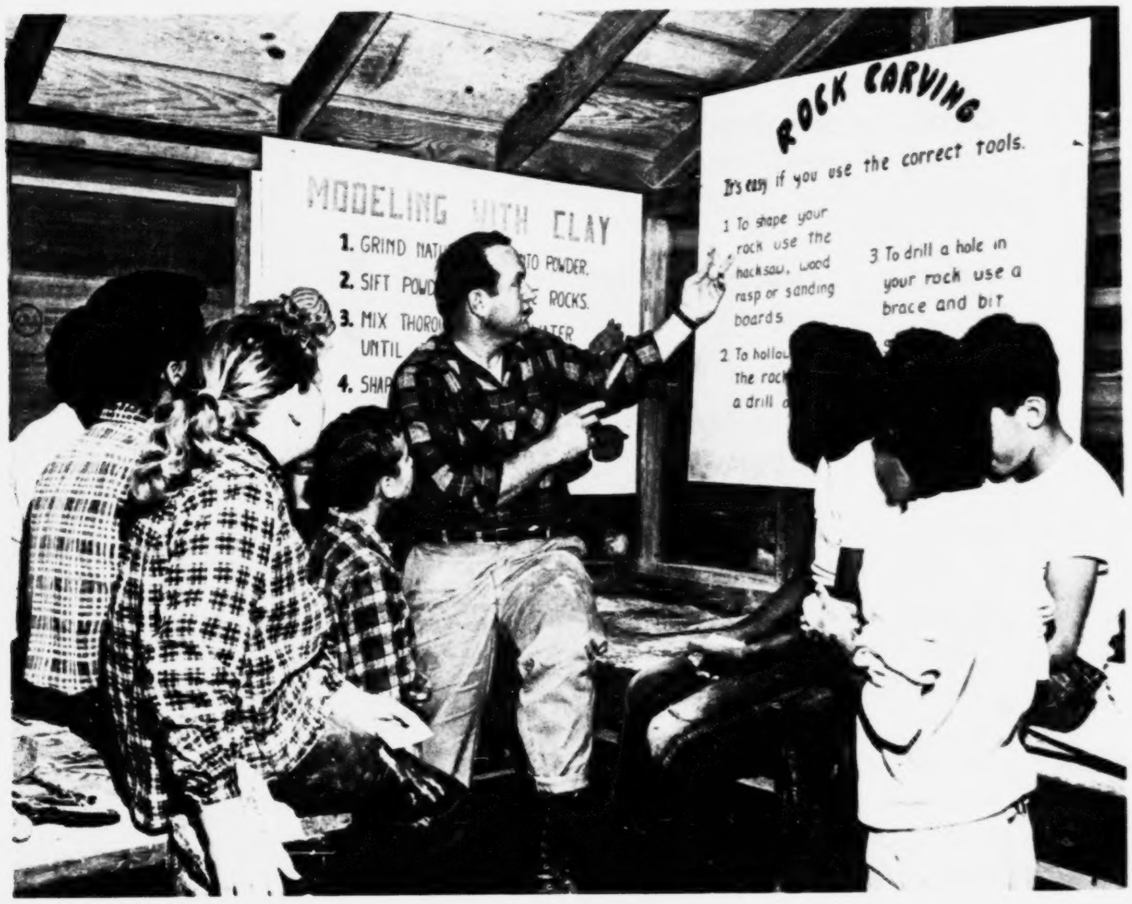
A. Craft hikes to study, appreciate and sometimes collect materials

B. Craft work in shops

1. Modeling native clay that has been found in the area and processed by children

2. Arranging lichen, chaparral twigs, and bark to make miniature scenes or dwarf gardens

3. Rock carving in massive gypsum (alabaster)


MODELING WITH CLAY
1. GRIND NAT TO POWDER.
2. SIFT POWD ROCKS.
3. MIX THOROU ATER UNTIL
4. SHAP
ROCK CARVING
It's easy if you use the correct tools.
1 To shape your rock use the hacksaw, wood rasp or sanding boards
2 To hollow the rock a drill
3 To drill a hole in your rock use a brace and bit

Learning how to do it right

Carving soft rock

    4. Making dried weed and flower arrangements
    5. Carving and fashioning objects of wood, pine cones, and other forest products
    6. Making plaster of Paris casts of animal tracks, leaves, flowers

VI. MUSIC EXPERIENCES

- A. Singing camp songs
    1. At general meetings, activity meetings, evening programs
    2. On activities, hiking, working, etc.
    3. In cabin
    4. At mealtime, in saying grace, and when washing dishes
- B. Listening to "mood" recordings during rest time, bedtime, meals, and camp and work experiences

VII. EXPERIENCES IN PHYSICAL EDUCATION AND RECREATION

- A. Square dancing
- B. Fishing
- C. Stunts
- D. Tumbling
- E. Games
- F. Contests
- G. Snow sports
- H. Hiking

VIII. EXPERIENCES IN DEMOCRATIC PRACTICE AND GROUP ACTION

- A. Planning for enjoyable and safe living in cabins
- B. Establishing standards of courtesy, consideration and conduct
- C. Discussing and attempting to solve problems at camp
- D. Making choices of activities--activity sign-up
- E. Sharing experiences
- F. Evaluating experiences
- G. Making decisions about the program

IX. OUTDOOR SKILLS TAUGHT

A. Use of compass and map

B. Use of "Mineralight"

C. Use of Geiger counter

D. Ore panning (mining)

E. Use of planetarium

F. Fire building and outdoor cookery

G. First aid procedures

H. Use of craft and conservation tools

I. Animal tracking

J. Survival techniques

K. Use of weather instruments

L. Use of telescopes and field glasses

M. Use of microscope and magnifying glasses

N. Use and care of fishing equipment

Using map and compass on all-day hike

Fishing in the pond

VARIATIONS IN THE PROGRAM

The program of activities will vary at each of the camps because of the differences in the physical plant and the surrounding environment. However, all of the basic learning experiences will be included in each of the outdoor programs. These are described in the camp teacher's guide which may be found in the camp kit.

In planning with the students for participation in the outdoor education program, the teacher should bear in mind that specific activities may not be available during the week for one of the following reasons:

1. Changes in weather--snow, rain, wind. (Cookouts and all-day hikes may be canceled. An inclement weather program may be in effect all week.)
2. Changes in season.

   -Trees can be planted only during a short wet season.
   -Snakes or cattle may rule out certain hikes.

3. Special conditions.

   -There may not be an active beetle problem to control.
   -Flood or fire conditions may offer special opportunities.
   -Illness may limit the program.

There is less chance for disappointment when camp activities are planned in general terms and on a tentative basis.

In order to get up-to-the-minute information about activities, the class might write to camp to have questions answered. Requests for information should be mailed to the camp several weeks prior to the encampment.

THE SCHEDULE OF ACTIVITIES

A sample of weekly schedules for the camps is presented here to give an overview of the week's activities and to show the sequence of experiences throughout the day. Changes may be made in the schedule because of weather, special seasonal interests, and unforeseen emergencies. The schedule will provide a framework from which to depart.

In general, the schedule of time periods will be adjusted so that getting up time will be earlier in spring and fall and later in the winter.

Visitors who plan to eat at camp should check with the camp principal to learn the exact time at which meals are served so they will not arrive too late for meals.

A more specific and up-to-date schedule will be distributed at camp to classroom teachers to aid in planning for participation in and observation of the outdoor education program.

SCHEDULE OF WEEK'S ACTIVITIES AT THE SCHOOL CAMPS

Time	Activity	Monday	Tuesday	Wednesday	Thursday	Friday
						Pack and clean-up
6:30	Reveille					
7:15	Breakfast gong					
7:30	Breakfast dishes					
8:15	Cabin clean-up					
8:50	Flag raising		Song and pledge	Song and pledge	Song and pledge	Conference with teachers
9:00	Morning assembly	Staff meeting	Singing WeatherReport Nature lore Divide groups	Singing Nature lore Divide groups	Singing Nature lore Divide groups	Square dancing Museum "Woodquiz Scramble"
9:30	Morning activity	Arrival of campers	Conservation activities Observation and mine (Palomar only) Nature hike Craft Hike Crafts Ecology	Conservation and observatory (Palomar only) Nature hike Craft Hike Crafts Mining Ecology	Conservation and cookout Observatory and mine(Palomar) Nature hike Astronomy Ecology Geology	Geology Ecology Lunch
11:30	End of activity	Divide campers into living groups				Singing
	Wash-up					Departure of campers
11:45	Lunch gong	Orientation				
12:00	Lunch					Counselors check and close camp
1:00	Rest	Orientation of campers	Singing Sharing Nature lore	Singing Sharing Nature lore	Singing Sharing Nature lore	
		Health inspection				
2:00	Afternoon activity	Orientation of teachers	Crafts Geology Ecology	Crafts Mining Fishing	Crafts Geology Pond Ecology Fire Protection	
4:00	End of activity	Camp exploration hike				
	Leisure of games					
4:30	Showers & sign-up					
5:30	Supper gong					
5:45	Supper					
6:30	Special interest		Astronomy	Astronomy		
6:50	Evening program gong	Story of the forest	Indian ceremony	Sharing experiences	Skits or star hike	
7:00	Evening program			Frontier games	Evaluation session	
8:00	Wash and to bed					
8:30	Story					
9:00	Lights out - quiet					

II

WHY SHOULD CHILDREN LEARN IN THE OUTDOORS DURING SCHOOL TIME?

Camping offers unique opportunities for meeting the growth needs of boys and girls. The twenty-four-hour-a-day camp living situation affords a new psychological and sociological as well as a new physical environment wherein new understandings and relationships can be encouraged.

The outdoor environment is rich in opportunities for firsthand experiences that encourage exploring and discovery and promote a spirit of adventure. The outdoor environment introduces many new experiences: different odors, strange sounds, and interesting discoveries. The simplicity of natural surroundings brings clearly into focus many fundamental laws and forces of nature that affect our way of living. The beauty of the outdoors brings an emotional and spiritual uplift. In this climate of high motivation, strong purpose, and readiness for learning, the intellectual and spiritual horizons of young people can be widened.

Outdoor education during school time provides the opportunity to use the classroom to plan for improved experiences at camp and, also, to use the camp and outdoor experiences to add vitality and enrichment to the school instructional program.

Some expected outcomes of outdoor education are:

-Boys and girls coming from different schools, different economic levels, and different racial and cultural groups begin to understand and appreciate each other through sharing camp and outdoor activities.

-The child and teacher discover each other as individuals. This increased understanding influences their post-camp classroom relationship.

-The child appreciates the worth of group action in planning solutions for problems in camp, sharing ideas, setting standards, and evaluating the results of planned activity.

-The pupil develops a deeper understanding of the need to conserve natural resources.

-The child develops an increased interest, understanding and appreciation of natural science and outdoor life which will enrich his home and school life.

-The child gains fuller realization of the importance of good health habits and safety practices.

-Children develop an increased awareness of the important part science plays in their lives.

-Many individuals in need of recognition are able to gain recognition in non-academic activities.

III

WHY SHOULD THE CLASSROOM TEACHER PARTICIPATE WITH HIS CLASS GROUP?

The outdoor experience affords the classroom teacher an opportunity that is unique and of great potential value. Some of the values reported by teachers who have participated in the outdoor education program are:

Studying children objectively--

"It gave me a chance to study my students objectively while they were being instructed by the camp counselors."

Observing technique--

"It was valuable for me to observe the methods and techniques used with some of my children by eight or nine other teachers. I was able to evaluate the methods; I got some new ideas for approaches with some of my 'problems.'"

Increased understanding of children--

"I realized anew what youngsters will and can do when they are highly motivated."

"I saw some important changes in attitude take place in some of my 'habitual failures' when they were successful in some of the camp activities. I am going to try to plan for enough variety of experience in my room so that every child will succeed in something."

"This week has caused me to realize that I was beginning to see my youngsters as pupils rather than children. I think the most important times for the classroom teacher to observe are during the cabin living activities such as taking showers, going to bed (especially the spiritual tone just as lights are turned out), cleanup time and even quiet time and just after supper."

"Seeing them in these activities caused me to be more aware of each child as an individual personality. I've seen them with their guard down, sometimes lonely, uncertain, often insecure, frightened; sometimes putting on a front, striving for recognition. They are really pretty tender."

Planning ahead

"I've had a chance to do a lot of planning for next week when we are back at school."

"I have thought of some ideas for new approaches and interests."

Spirit of exploring and adventure--

"Camp gave us an exciting experience which we shared in a spirit of adventure. I have been able to instill some of the camp techniques of exploring and discovering into many of our classroom activities."

A common background--

"Our sharing of such an experience has provided us with a common background that has been the source of much creative activity."

Approach to conservation unit--

"Outdoor education provided a springboard for the conservation unit."

Citizenship--

"It came as a culmination of our efforts in citizenship, especially learning to meet with new people and share with them. Most of the class showed growth in courtesy."

Personal and social hygiene--

"Going to camp gave us a good approach to our program of teaching personal and social hygiene. Going away from home and living closely with others for a week is a natural for teaching about growing up and understanding others. Sex education, menstruation, cleanliness and wholesomeness are appropriate subjects for discussion in preparing for such an activity."

Rapport--

"The week at camp is a powerful, unifying experience."

"It developed better relations among the children. New friendships have been evident."

"I felt I was able to smile more with the children. I gained a fresh understanding of the magic of a warm smile and a friendly manner. I think it is the best answer to many of the insecurities felt by children."

IV

HOW CAN THE TEACHER PARTICIPATE EFFECTIVELY IN THE OUTDOOR EDUCATION PROGRAM?

Since school children and teachers participate in the outdoor education program during school time, it should be on the assumption that their participation will contribute directly toward furthering the instructional program and understanding of students. The concept of outdoor education as a field laboratory phase of the instructional program is a departure from the traditional idea of camping as being primarily recreational. Although the outdoor instructional program will result in many recreational values, the week at camp should not be considered as a vacation from school for either the children or the classroom teachers.

DUTIES ENROUTE TO CAMP

The classroom teacher becomes an active participant before the camp-bound busses arrive at the school Monday morning. The teacher:

- -With the school nurse, makes a brief inspection for obvious cases of illness.
- -Checks to see that both school and bus personnel know what time the children will return from camp on Friday.
- -Distributes heavy paper bags to children who are subject to car sickness.
- -Prepares children for activities and expected conduct on the bus.
- -Works with the bus driver for a safe enjoyable trip.
- -Makes use of the itinerary of the bus trip that has been developed. (See chapter VIII, page 72.)

ARRIVAL AT CAMP

Check with the head counselor about:

- -Living quarters.
- -Securing luggage.
- -Time of orientation meeting.
- -Counseling at table for first meal.
- -Obtaining copies of the camp teachers' and classroom teachers' guides.
- -Obtaining materials for printing name tags. (Print name you wish campers to use.)

FIRST DAY AT CAMP

For the first day at camp the general theme of the outdoor education program is orientation to the mountain environment-- the forest, the buildings, the people, and the opportunities for adventure and learning. As a prerequisite to the important business of planning for an exciting worthwhile week, orientation is provided for teachers as well as for children.

ORIENTATION FOR THE TEACHER

The head counselor will meet with all classroom teachers for approximately an hour on Monday to discuss the outdoor education program, the teacher's participation in the program, and any problems or questions related to the week at camp.

This meeting should be at a time when it does not interfere with the teacher's opportunity to visit the cabins and listen to the planning being done by children. In fact, the children's planning is additional orientation for the teacher because it delineates the standards and rules of behavior that will be established for each cabin group.

Teachers new to the program should plan to join one of the cabin groups as they take an orienting tour of the camp.

SUGGESTIONS FOR EFFECTIVE PARTICIPATION AT CAMP

Certain values have been mentioned as possible outgrowths of the field experience at camp. The following suggestions are offered to the teacher to guide him in realizing these values:

Learn about children through observation and study--

Plan to observe all phases of the outdoor education program--especially those involving activities of living together (shower time, bedtime, cleanup time).

Maintain liaison between teachers and counselors--

If you are especially interested in particular children, bring this fact to the attention of the camp principal or the head counselor and plan with him so that you can be scheduled on an activity with them. The all-day hike or conservation project are good activities that are well suited for observing children over a long period of time.

The classroom teacher can promote understanding of children by providing pertinent background information to camp staff members. The camp staff can subsequently keep the classroom teachers informed about any significant behavior of the children in question. Good liaison between the teachers and camp staff can be mutually beneficial. It is important that the camp staff be informed about all special, adjustment or gifted children before they arrive at camp so that planning can be done to insure desirable approaches and treatment.

Observe teacher-counselors as they work with children--

Plan to associate with many different camp teachers in order to observe the wide variety of approaches and techniques that are used with children. Observations of the relative effectiveness of various approaches and techniques upon child behavior may lead to increased insight concerning your own approach to your students.

Share experiences with children--

Be a participant with the campers in many activities. Try to show that you enjoy the activities with them. Contribute to the spirit of adventure. Laugh and be a good sport. Such participation leads to good rapport; a common bond that results from sharing an exciting experience lays good groundwork for post-camp experiences in the classroom.

However, in the informal spirit of the camp situation, be mindful that you are still the teacher and that a relationship of respect should continue to exist. Guard against undue familiarity. In general it is advisable to discourage the children's use of the teacher's first name. Some may be inclined to take advantage of this opportunity to become over-familiar.

Planning for post-camp experiences--

While you are at camp, take notes of any ideas that may prove useful in post-camp experiences.

Plan with some of your students for follow-up activities growing out of the weather station activity, crafts, nature study, science and conservation.

Encourage students to make collections for class museum displays: rocks and minerals, wildflowers, chaparral and tree specimens, insect damage (bark section of trunk) and so forth.

Share responsibility for discipline and guidance--

You are not expected to relinquish all of your responsibility for the behavior of your students while at camp. Even though the camp teachers may have the prime responsibility for controlling the learning situation, there will be many opportunities for you to counsel and guide your students.

Since the informal atmosphere at camp may be quite different from the well-disciplined tone of the classroom, it is conceivable that two different approaches made simultaneously to a child's problem might result in confusion for the child. To safeguard against this, it is suggested that whenever and wherever possible, the classroom teacher should work with the camp teacher in dealing with the child. There will be many times when the teacher will need to counsel directly with the child.

Help to reduce the size of activity groups--

In coeducational camping it is desirable to have both a man and a woman with each coeducational group. It is also desirable to have the groups relatively small. You may be able to help make this desirable grouping possible by teaming up with a camp teacher for a particular activity. The camp teacher has the responsibility for organizing and carrying on the activity. The classroom teacher's role is that of the second adult.

Help on hikes--

On hikes it is good practice to have one adult at the head of the hiking group and one at the rear. The teacher usually checks to see that no stragglers get lost and that the group stays together so that all can share in questions, explanations and discussions of general interest.

It is not necessary for you to go on one of the all-day hikes; you may prefer to help supervise an in-camp group. There are always some children who are physically restricted or not inclined to like long hikes. These children usually combine a short walk with other activities of a leisurely nature.

Help with craft activities--

Teachers usually select a craft activity on the basis of interest. The craft period is an excellent time to work individually with campers in a climate of enthusiasm and interest. Circulating from one worker to another with a stimulating question, a suggestion, or a helping hand to steady the material builds good rapport.

The craft period is not an appropriate time for the teacher to engage in a craft project of his own. Such projects usually require the full attention of the craftsman. The teacher's function is to work primarily with children, not materials.

Supervise in the dining room--

During the mealtime: mealtimes at camp provide excellent opportunities for teaching desirable attitudes and eating habits. The specific objectives and procedures for encouraging wholesome and interesting table conversation, table manners, and a friendly atmosphere are described in detail in the camp teachers' guide. The dining room will be more quiet and relaxed if every table counselor encourages a quiet relaxed tone at his own table.

Each table counselor will have explained to his table group all the necessary details for washing dishes in a sanitary manner. (See camp teacher's guide.) The supervising teachers, working with the camp dining room supervisor, will check to see that the procedures are followed. The roving type of supervision--checking for clean hands, clean towels, clean tables and clean dishes--is most effective.

Details of supervising during meals and dishwashing will be explained by the dining room supervisor.

Contribute special skills and interests--

Discuss with the camp principal or head counselor any special skills or interests you may have that you would like to share with the program.

Some teachers have asked to lead such activities as group singing, choric verse, dramatic skits, sketching, finger painting and star study. The head counselor will work with you in scheduling time for such activities.

Inspect cabins and report to group--

A camp activity that has been surprisingly well-received by children and teachers is the cabin cleanup followed by a tour of inspection by the classroom teachers. Standards are very high. On a scale of ten points, it is very rare that any cabin receives a full ten points on the first day. The idea is to encourage improvement. In reporting the results to the assembled group, it adds interest if the low scores are reported first, with the high scores saved for last.

It is not uncommon for all cabins to end the week with nearly perfect scores.

Clothing and Equipment to Take to Camp

In general the clothing worn by teachers at camp is typical of and appropriate to outdoor living.

The selection of clothing should be determined in part by the season of the year. At elevations of over 4,000 feet, the camps have extremes of temperature. Many nights and days in wintertime will have subfreezing temperatures. Snow can be expected during the winter. Even in the fall and spring, when daytime temperatures may be high, the nights may be very cool. (If it is necessary for you to have a car at camp, check for overnight freezing.)

The clothing you take to camp should be comfortable, especially shoes for hiking. Beware of new jeans or shoes bought for camp; break them in first.

Mark your flashlight, camera, etc. with your name. Do not bring valuables to camp. There is no safe storage place for them.

Usually one suitcase and one bedroll is sufficient to carry your clothing and equipment.

Some suggested items you may want to take to camp are listed on the next page for your convenience.

Clothing and Equipment to Take to Camp

	Essential Items	Recommended Number
BEDDING, LINEN	Sleeping bag or blankets	4-6
	Sheets (muslin or flannel)	2
	Bath towels	2-3
	Wash cloth	1
TOILET ARTICLES	Toothbrush	1
	Toothpaste	1
	Soap	1 bar
	Comb	1
	Kleenex	1 box
CLOTHING	Heavy jacket or coat	1
	Heavy sweater	1
	Slippers	1 pair
	Hiking shoes (1 pr. high, water-resistant: old or new must fit properly; composition soles recommended. Heavy tennis, okay.)	2 pairs
	Rubbers or galoshes	1 pair
	Undershirts	4
	Underpants	4
	Socks	6 pair
	Hat - stocking cap	1
	Gloves or mittens	1 pair
	Pajamas	1 pair
	Handkerchiefs	3
	Jeans or slacks	3
	Shirts or blouses	4

	Convenient Items	Recommended Number
BEDDING, LINEN	Pillow	1
	Pillowcase	1
CLOTHING	Raincoat	1
	Belt	1
	Scarf or bandana	1
	Bathrobe	1
TOILET ARTICLES	Hand lotion	1 bottle
	Soap box	1
	Hair brush	1
	Mentholatum or Chapstick	1
	Shower shoes	1 pair
	Shower cap (girls)	1

Convenient Items		Recommended Number
EQUIPMENT	Laundry bag	1
	Flashlight	1
	Canteen	1
	Camera and film	1
	Compass	1
	Jackknife	1
	Sun glasses	1 pair
	Stationery	-
	Stamps	-

FROM DECEMBER-APRIL, DURING WINTER MONTHS, TAKE:

Rubbers or galoshes
Gloves or mittens
Raincoat
Rain hat or cap

A Message from the Camp Staff

Welcome to camp! We're very glad to have you with us. One of the special satisfactions of our work is to get to know so many wonderful teachers throughout the year. We will look for you in the staff lounge on off-duty time. There is always coffee in the pot, music to be enjoyed, subjects to be discussed, and games to be played.

We are pleased to have this opportunity to provide special instruction which we hope will contribute significantly to the education of your students who have come to camp this week.

We look forward to working with you in this joint effort to provide worthwhile experiences for children.

V

HOW CAN THE TEACHER PLAN WITH PUPILS TO PREPARE FOR THE OUTDOOR EDUCATION PROGRAM

The following can be used as a checklist which may help to guide the teacher in making plans to prepare students for camp.

___ Check the date of encampment early in the year to plan for timing with the conservation unit.

___ Discuss with students the brochure to parents publicizing the outdoor education experience.

___ Confer with the principal regarding children in need of help from the Campership Fund.

___ Use the study prints and other materials in the camp kit to prepare an interesting bulletin board display about going to camp.

___ Cooperate with the principal in meeting with parents and showing a film strip with narration of the outdoor education program.

___ Show filmstrip to the class.

___ Study the Teacher's Guide to Outdoor Education to get suggestions for relating school and camp programs.

___ Discuss with students and send home the "Health and Registration Sheets." These are distributed from the San Diego City-County Camp Commission Office, Civic Center, San Diego.

___ Discuss with students and send home the "Camper Inventory List of Clothing and Equipment." The lists are furnished by the San Diego City-County Camp Commission Office, Civic Center, San Diego.

___ Prepare a list of students who are going to camp. Use forms furnished by the camps. These are to be sent to camp one week in advance of the encampment even though the list may not be complete.

___ Discuss and develop itinerary for bus trip to camp. (See Chapter VIII.)

___ Locate and use the camp kit.

ENCOURAGING CHILDREN TO GO TO CAMP

If some children are not going to camp, learn the reasons why. Use tact to avoid embarrassing the sensitive child. Some of the reasons for a child's not going might be:

-Lack of finances.

It is easier for children to finance their trip if they start saving a year in advance. Use the brochures to publicize the outdoor education program in the savings and thrift program. Check with the principal about the Campership Program.

-Lack of interest.

-Misunderstanding of the outdoor education program.

-Parents' reluctance to allow the child to be away from home.

-Child's responsibilities--home duties, jobs.

-Lack of clothing and equipment.

There are a few blankets, a limited supply of clothing, rubber boots, and rain gear at camp which may be used by pupils who cannot furnish their own. The clothing and equipment list can be modified.

-Fear of embarrassment due to personal problems (enuresis, walking in sleep).

-Fear of inadequacy of camp to care for individual health problems.

A full-time camp nurse makes it possible for the camp to provide some special care for children with health problems that are not communicable.

Start the initial plans for the outdoor education program early so that there will be time to solve the children's problems.

The outdoor education program offers an opportunity for constructive public relations, an opportunity to get to know parents better through discussion of a common interest. Teacher and principal conferences with parents have proved to be effective in solving some of the problems that keep children from camp.

While attendance at camp is generally desirable for all children, there may be some reasons why it may not be best to strive for 100 per cent attendance. The teacher should not feel under pressure to achieve total participation nor should children feel under group pressure to participate.

VI

HOW CAN THE TEACHER PLAN TO UTILIZE THE OUTDOOR EDUCATION EXPERIENCE TO FURTHER THE CLASSROOM INSTRUCTIONAL PROGRAM?

The educational values of the outdoor education program are sufficient in themselves to warrant its inclusion as a regular feature of the school program.

The potential values of outdoor education extend beyond the program at camp into the classroom instructional program. Thus, outdoor education can become more than an end in itself; it can become a means to an end. It can be used not only to add supplementary enrichment values, but also to improve the quality of instruction in the various subject areas. As a real life, highly motivated field experience, it can bring added vitality, understanding and interest to many phases of classroom instruction.

Suggestions for using outdoor education experiences to benefit the various subject fields are presented in this chapter. In most cases the suggestions are grouped as pre-camp experiences or post-camp experiences. (A brief summary of the at-camp experiences is included in Chapter I.)

Outdoor education experiences can be used to:

-Promote health and safety.
-Motivate the reading program.
-Enrich the language program.
-Add meaning to the arithmetic program.
-Supplement the physical education program.
-Broaden the arts and crafts program.
-Add enthusiasm to the music program.
-Add reality to the social studies program.
-Improve science instruction.

OUTDOOR EDUCATION PROMOTES HEALTH AND SAFETY

Point of View

Outdoor education encourages students' interest in planning for health and safety. Generally, children are eager to go to camp. They understand that an injured or sick child should be returned home for care and treatment. They can appreciate that they must remain safe and well in order to stay at camp. This is not a threat; this is reality. Reality should be the keynote for planning for health and safety.

Pre-camp Experiences in Health and Safety

Planning for a real, tangible, foreseeable situation adds a feeling of purpose to the planning. Some questions that will be of interest to prospective campers are:

-Are we well enough to go to camp? (Guard against upsetting the handicapped child who may be very sensitive to the fact that he may not be well enough to go to camp.)

Use the health and registration sheet provided by the San Diego City-County Camp Commission Office as a guide for answering this question. Take this opportunity to consider why a difference in elevation may be a health factor (asthma, heart, rest).

-Why, in a somewhat isolated group living situation, should we be concerned with communicable diseases?

-Why do we need a health check before going to camp?

-How can we keep well at camp?

This question provides an opportunity to discuss the following basic needs of good health:

- To have a balanced and varied diet.
- To eat regularly at a leisurely pace and in an atmosphere of quiet and relaxation.
- To dress appropriately for the activity and the weather. Discuss the clothing list furnished by the San Diego City-County Commission Office.
- To be alert to personal health needs in the outdoor education program.
- To keep the nurse and the camp staff informed about health needs.

Eating in the camp dining room

- To limit activities to health and physical abilities.
- To get adequate rest for a very active program in a high elevation.

-How can we keep safe at camp?

Specific instructions will be given at camp. Discuss and establish general standards of safety.

This question can be generalized to cover safety learnings at school and at home:

- Learn about the possible safety hazards.
- Learn about safety rules and safe conduct.
- Abide by the rules.
- Consider the other fellow.

The camp nurse helps children to keep well at camp

Post-camp Experiences in Health and Safety

Some camp activities are also a part of children's usual leisure-time activities that they might well be included in the class health and safety instructional program. An example of an outline of some of the safety practices that can grow out of post-camp planning is one relating to hiking:

-Getting lost

Remember--it is easy to get lost in strange country.
Make sure that someone in camp or at home knows where you plan to go.
Stay with your group.
Learn to use your compass or to use your watch as a compass.
Notice landmarks at all times.
Stay out of the brush if you do get lost. Don't get excited; help will come.

-Rocks and cliffs

Wear rubber-soled shoes.
Avoid pushing and shoving.
Don't take unnecessary chances.
Try not to dislodge boulders that may roll.

-Limbs and twigs that blind

Be sure that no one behind you will be slapped by a springy twig as you let go of it.
Hold the twig for him if necessary.
Stay a safe distance behind the person in front of you.

-Blisters

Wear comfortable shoes and socks. Avoid cowboy boots--they are not for hiking.
Report any blisters to the hike leader.

-Cramps and heat exhaustion

Drink sparingly.
Rest after eating.
Thin air in high altitudes means more rest is needed.

-Poison oak

Wear long sleeves.
Learn to recognize poison oak.
Avoid it by staying with the group.
Immediately wash with soap if contacted.
Report to hike leader.

-Rattlesnakes

Wear trousers and heavy shoes.
Be alert! Watch hands in climbing.
Avoid any snake; it might be a rattler.
Stay with the group on the trail, especially during snake season.
Check to see that someone in your group has a snake-bite first aid kit.

Exploring new places

OUTDOOR EDUCATION MOTIVATES READING

Point of View

The outdoor education experience offers many opportunities for providing increased motivation, meaning, variety, purpose and enrichment in the reading program.

Precamp experiences

Read to prepare for improved experience at camp and to gain background information:

-History of camp and mountain area.

- Indians
- Early settlers

-Nature study and science

- Stars
- Weather
- Rocks and minerals
- Plants and animals

-Conservation experiences.

- How a tree grows
- Problems of the forest (See social studies guide for conservation unit.)

Develop an expanding concept of the nature and function of reading in the outdoors. The following may be read directly to students to encourage prospective campers to read nature's books when they get in the outdoors:

> "We have learned to read these black ink marks on this paper. The shape of each mark and the way the marks are put together have meaning for us. These marks are symbols or signs that tell us something. When we go to camp we will find different kinds of symbols and signs to read, just as our pioneer ancestors found the same symbols and signs.
>
> "Many early pioneers or Indians could not read the simplest story in one of our books. But these woodsmen had books of their own to read and they learned to read them with great skill. Their books were the animals, the plants, the heavens, the streams, and the rocks. Their signs and symbols were the tracks of animals, birds, and insects; the markings and appearance of tree trunks, leaves, moss and twigs; the wind, the clouds, and the stars. They could read thrilling stories of life and death struggles. By reading the signs of plants and animals, they could foretell the weather. They were probably better readers of their books than we are of ours.
>
> "When we go to camp we will have a chance to learn some new signs and symbols to read. We will learn to read them just as we learned

to read these words--by looking carefully to notice the shape of the symbols, to see how one differs from another; how they are alike. We will be able to read not only with our eyes, but also with our ears: the songs of birds talking together, the sound of a broken twig, the hush when all sounds stop. Our noses will tell us about smoke before we can see it, the smell of rain and wet things drying in the sun, the scent of pine and cedar, unpleasant smells of things dead, the nearness of Mr. Broadstripe. We will learn new smells that will tell us new stories. On a peak we will feel the tugging of the wind and learn of the great strength there is in the air about us. In the heavens we will read about our location and direction. We will learn about rocks and minerals by feeling them. The soft dampness of snow, the hard slick ice, the sharp chill of winter cold will tell us much if we are alert, if we are good readers at camp."

WATER IN SAN DIEGO
Reservoirs
Rivers
Dams
Storage Tanks
Big City Water Supply
DAMS and RESERVOIRS of San Diego

Reading for
background
information

Post-camp Experiences

Read for further research about questions and problems raised at camp.
Read about new interests raised by the outdoor education experience.

OUTDOOR EDUCATION ENRICHES LANGUAGE

Point of View

"Growth in language is dependent upon experience. Vocabulary development cannot be separated from a child's background of meaningful experiences. Child-like spontaneous expression emerges from purposeful, interesting, concrete experiences."*

Camping and outdoor living are a great adventure for boys and girls. The outdoor education program is filled with experiences that elicit feelings of anticipation, excitement, thrill, enjoyment, fellowship, suspense and spiritual awakening. The quickening of emotion and the stirring of imagination tend to motivate the desire of campers to express themselves.

Participation of children in interesting, purposeful real-life experiences leads to increased insight and understanding and provides a basis for sharing with others the reactions to the experience.

Some of the ways in which teachers have used the motivating and outdoor education program to further the classroom language program are:

Pre-camp Language Experiences

Group discussion:

- Solving problems.
- Establishing standards.
- Preparing activities.
- Planning how outdoor experiences can relate to the conservation unit and other classroom studies.

Oral reports:

- Of committee progress.
- On related subjects of interest (history of mountain area, Indian life, plants, animals, stars).

Letter writing:

- Reviewing the correct form and principles for writing letters in preparation for writing home from camp.

- Writing to camp expressing special class interests and asking for up-to-date information about the camp program.

- Writing to related organizations for pertinent information (United States Weather Bureau, United States Forest Service).

- Writing to students of other schools who will be in camp at the same time.

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*Curriculum Guide--The Elementary Program, San Diego City Schools

Camp diary:

Encourage students to keep a diary at camp; giving instructions and some practice in diary writing.

Newspaper reporting:

Write articles about the proposed trip to camp for either the school or community newspaper ("Dreaming of Camp", etc.)

Vocabulary and spelling:

Study camp-related words before going to camp.

Cuyamaca
Descanso
Laguna
Palomar
observatory
Doane
mountains
mesa
conservation
Indian
counselor
chaparral
ecology
astronomy
Marston

Creative expression:

Encourage students to prepare skits related to outdoor experience for presentation at an evening program. (Discourage usual TV and radio takeoffs.)

Post-camp Experiences

Creative expression:

Plan a program to share outdoor experiences with the children's parents, and fourth and fifth grade students, and their parents to acquaint them with the camp program for next year. The program could include:

-Dramatic impressions of camp activities (humorous, exciting).
-Poems growing out of outdoor experiences.
-Reports on "What Camp Meant to Me" or "What I Learned at Camp."
-Quiz games to test outdoor education learnings.
-Explanations of displays of materials collected at camp (rocks and minerals, beetle damage, etc.).
-Comments on craft displays.
-Spelling bee on new words learned in the outdoor education program.

Newspaper publishing:

Publish a "Special Camp Edition" of the class newspaper or the school newspaper ("Memories of camp," "My Greatest Thrill at Camp," "We Helped the Forest," "Can You Guess This?").

Letter writing:

-Letters to camp teacher giving reactions to the program and describing some of the follow-up activities

-Letters to camp friends from other schools.

Group discussion:

-Discussion leading into post-camp consideration of the conservation unit (See writeup of "Camp and the Conservation Unit.")

-Evaluation of outdoor and camping experiences.

-Plans for a post-camp program.

Oral and written reports:

Do not labor the outdoor education experience and squeeze it dry of interest and motivation by demanding too many assignments related to it. The quality of reports will probably be higher if the oral and written reports are voluntary rather than assigned.

Vocabulary and spelling:

Develop a dictionary of new words learned in relation to outdoor education.

weather

relative
humidity
moisture
thermometer
psychrometer
prevailing
forecast
evaporation
hazard

topography

elevation
mountain
mesa
ridge
divide
gully
contour
valley
watershed

astronomy

telescope
observatory
museum
galaxy
constellation
heavens
planets
solar
satellite

ecology

habitat
community
hebivore
carnivore
predator
parasite
scavenger
biology
laboratory

forestry

wildlings
seedlings
snag
cambium
sapwood
heartwood
timber
duff
slash

mineral

igneous
sedimentary
metamorphic
crystal
luster
scheelite
granite
alabaster
gypsum

geology

erosion
soil
profile
fault
vein
decompose
bedrock
ore
dike

crafts

dwarf
carving
plaster
casting
modeling
buff
polish
jewelry
design

equipment

Geiger counter
violet ray light
microscope
magnifying glass
compass
prism
planetarium
mortar
pestle

OUTDOOR EDUCATION ADDS MEANING TO ARITHMETIC

Point of View

The outdoor education program provides many opportunities for real-life experiences in the social aspects of arithmetic. It gives the teacher a chance to encourage students to use arithmetic skills and concepts in situations where the students are moved by a strong feeling of purpose to solve problems.

This is a good time to involve students in the development and formulation of problems that are meaningful to them.

Some pertinent questions that students ask at this time may be used as the basis for class experiences in formulating and solving problems. The following questions and problems are presented in the hope that they will suggest other arithmetic experiences.

Pre-camp Arithmetic

Answers may be found to questions such as:

-How far is it to camp from our school? (Encourage children to bring highway maps to class for reference use.)

-How much higher will we be at camp than we are here at school? (Consult topographic maps in camp kit.)

Post-camp Arithmetic

Many problem-solving situations may grow out of the experiences that have been shared at camp. The following examples may suggest other problems.

Beetle control:

-If students cut down as many trees every day as we did on the day we worked on beetle control, how many trees would they cut down in a week? month? school year?

-Approximately how tall was the tallest tree cut down? How can the height of a tree be measured while it is still standing?

-Into how many sections did you "buck" the tree? How long was each section?

-What is a board foot?

Hiking:

-Why is it wise to estimate distance before you hike?

-How far do you think you hiked on your all-day hike? List estimates to be compared with computation later.

-How could we learn the distance that each of us hiked?

Refer to the topographic map that the campers learned about at camp. Find copies in the camp kit or use the map provided at camp. Trace the route on the topographic map, checking truck trails, streams, valleys and peaks for bearings. Lay a string exactly on the traced route.

Straighten the string to show the full distance hiked. Discuss how many miles the string shows the hike to have been by pointing out that:

- The string tells us nothing until we relate it to the scale of miles to which the map was drawn.
- The string must be measured, and the measurement translated into miles.
- Ask if this distance allows for going uphill and downhill? (No)

-What is the elevation at camp?

-How many feet higher than this did you hike?

Topographic map may be checked for elevations. Sometimes the peaks are marked; sometimes it may be necessary to refer to the contour lines joining places of equal elevation.

- Numbers indicate some of the elevations.
- Contour intervals are 50 feet? 40 feet? 100 feet?

-Approximately how many miles per hour did you average on your hike?

Map and compass:

-How can you use your watch as a compass?

-How many degrees are marked on a compass? (360°)

-If you are following a course of 270°, what direction are you traveling?

-Why is there a difference between magnetic north and true north?

Public land survey:

-What are some of the important units of measure used commonly in the outdoors? How are they used? (range, township, section, acre, chain, rod, pace)

The ride to camp:

-What was the average speed of the bus going to and coming from camp?

-How long did it take to ride to camp?

Other activities at camp:

-If lights are out in the cabins at 9:00 p.m. and reveille sounds the next morning at 7:00 a.m., how much time is provided for sleeping? What fraction of the whole day is this?

-How many squares can be made for square dancing if 2/3 of the group are dancing?

Further subjects for problems:

-Weather instrument readings (anemometer, psychrometer, barometer, fuel moisture index scale, and thermometer readings)

-Average number of quarts of milk per table, per meal.

-Cost of cookout meals.

-Total weight on a toboggan.

-Numbers and fractions of group involved in different activities.

THE OUTDOOR EDUCATION PROGRAM SUPPLEMENTS PHYSICAL EDUCATION

Point of View

"Since much of the child's day is devoted to physical activities, the experience acquired in school should be of the type which will improve his leisure-time recreation."*

Crossing the monkey bridge

Camping is a very universal and popular leisure-time recreation. The school outdoor education program provides a very realistic and suitable setting for teaching many of the skills of camping.

Some camping skills are not limited to use in a particular camping situation; they are commonly used on weekend outings and hiking or fishing trips. These more generally used skills might well be considered as pre-camp activities in the classroom since they also prepare the child for a variety of other leisure-time recreational activities.

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*Curriculum Guide--The Elementary Program, San Diego City Schools, p. 195

Hiking

Suggestions for safe hiking are included in the section on health and safety in this guide.

Square and Folk Dancing

All children have an opportunity to dance at camp. If your students learn dances that require certain records, bring the records. It helps when one group is able to teach a dance to another group.

Square dancing at camp is fun.

Other Leisure-Time Activities

During the week at camp, the children will learn many new kinds of leisure-time activities. This is a good time to give added emphasis to that phase of your physical education program that encourages social activities that might carry over into leisure time at home and in the neighborhood, such as:

- -Table games
- -Social group games (quiet, indoor, outdoor)
- -Stunts
- -Tumbling
- -Contests (pioneer-type activities)

Some of the physical activities at camp will be determined by the season and the weather. Prospective campers should understand that the following activities will be engaged in at camp on a limited and usually unpredictable basis:

- -Snow sports: tobogganing, snow sculpture and snow hikes
- -Rain hikes
- -Fishing

The outdoor education program is a winter program and, because of the weather and cold water, does not include swimming among its programmed activities.

More specific descriptions of some of the physical activities engaged in at school may be reviewed in Outdoor Education: A Guide to the Instructional Program in the Sixth-Grade School Camps.

OUTDOOR EDUCATION BROADENS THE ARTS AND CRAFTS PROGRAM

Point of View

"The elementary school art program contributes to the growth of children by providing opportunities for creative work and emotional expression, by enriching appreciation of nature and of man's handiwork, and by offering many and varied techniques and materials."*

One of the major purposes of the outdoor education program is to increase appreciation of nature's handiwork. First-hand experiences in the outdoors provide many opportunities for creative work and emotional expression.

Arranging miniature scenes

Looking to nature for inspiration and using natural materials of the environment encourage imagination and variety in the use of techniques and materials. The outdoor education program provides the classroom teacher with motivation and skills necessary to develop a greater variety of arts and crafts experiences in the classroom. Descriptions of materials, procedures, and expected outcomes of various arts and crafts activities at camp can be found in Outdoor Education: A Guide to the Instructional Program at the Sixth-Grade School Camps.

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*Curriculum Guide--The Elementary Program, San Diego City Schools, p. 211

Pre-camp Experiences

Art makes living more enjoyable through developing appreciation of the beauty that is around us. Thinking about the beauty we may expect to find in the outdoors, may develop a readiness to appreciate the beauty that is there.

Design:

-Shape of trees, twisted chaparral, leaves of plants, flowers, cones, bark, and shadows
-Different patterns of snowflakes (winter)
-Indian symbols for clouds, rain, sun, and so forth

Color:

-Sunset, clouds, birds, leaves, rocks

Composition:

-Always present, always changing from scene to scene

Perspective:

-Distant views, effect of distance on color, sharpness of focus (This may be a good time to illustrate some of the principles that you have been teaching in art.)

Texture:

-Feel of velvety moss, rough granite, smooth fungus, polished rock

As a pre-camp activity, have children illustrate "Dreaming of Camp" and "What I Want to Do at Camp." Plan now for post-camp activities in arts and crafts.

Post-camp Activities

Many children will bring home arts and crafts projects that have not been completely finished. Usually the tools and materials required to complete them are readily available either at home or at school (sandpaper, paints, brushes).

Many teachers have used the crafts program at camp as motivation for increased craft activity in the classroom. This can be done best by providing opportunities for the children to finish in class the projects that were not completed at camp. In some cases it may be possible to make arrangements for students to fire their clay craft pieces in a school kiln.

Examine the natural environment of the local community for materials that can be used for artistic self-expression. For example:

- Make interesting arrangements of seed pods, leaves, bark, etc.
- Make plaster casts of flowers, leaves, and tracks of household pets.
- Locate and use natural deposits of clay.
- Collect interesting pieces of driftwood and make interesting arrangements.
- With coping saw and rasp, carve abalone shell into ornaments and jewelry.

Some of the principles of composition and design may be used as returning students plan displays of materials collected at camp, such as:

- Rock collections.
- Collections of seeds and their equipment for dispersal.
- Samples of enemies of the forest.
- A display of how beetles kill trees.
- A cross section of tree trunk and how the tree grows.
- An exhibit for identification of seeds, pods, leaves and bark of common trees.

Some of the major activities in the outdoor education program may be recalled and recorded by means of:

- Dioramas--conservation, nature, history, Indians.
- Murals--conservation, nature, history, Indians.

More personal recollections of experiences in the outdoor education program can be expressed through a variety of art media. A set of instructions and suggestions for working with various media are included in the camp kit.

OUTDOOR EDUCATION ADDS ENTHUSIASM TO THE MUSIC PROGRAM

Music and camping are good companions. Camping provides opportunities for many interesting new experiences. Music provides the means of giving expression to the emotions that grow out of the experiences. The enthusiasm that characterizes camp singing can be capitalized upon by the teacher to add impetus, motivation, meaning and vitality to the classroom music program.

Singing is fun.

Pre-camp Singing

This is a good time to teach songs that reflect and express the spirit and enthusiasm of adventuring into the outdoors.

Many such songs are included in the State texts. These songs have the advantage of music notation and appropriate grade-level placement. Teachers should not hesitate to teach any good songs as a pre-camp activity. If some classes have already learned a favorite song, they are in a position to make a contribution to the outdoor education program by teaching the song to other campers during one of the camp song sessions. Such sharing is of value to the outdoor education singing program and benefits all concerned.

Post-camp Singing

On the last day at camp, the students will receive copies of camp song books containing the words for many camp songs.

The songs that have been learned at camp informally can be dressed up at school with descants, rhythm accompaniment, autoharp or harmolin accompaniment, or by adding other harmonizing parts. However, the teaching should not be so laborious as to lose the spirit of the song.

A description of the possible outcomes of the camp music program can be found in Outdoor Education: A Guide to the Instructional Program at the Sixth-Grade School Camps.

OUTDOOR EDUCATION ADDS REALITY TO SOCIAL STUDIES

Point of View

"The basic purpose of the social studies program is to develop the highest type of democratic citizenship. To attain this purpose, many opportunities are provided for the child to increase his understanding of the world in which he lives and to learn to adjust to it happily and successfully."*

The outdoor education program is one of the most important of the opportunities provided in the general area of social living. The outdoor education program can almost be considered a complete social studies unit in itself.

The experience of living together for a week in a camp and natural environment is broad enough to relate to any of the current sixth grade social studies units.

In instances when the conservation unit is not the one being studied at the time of the encampment, you may want to plan for a transition approach from the social studies unit you are studying to the camp experience you are planning. This can be accomplished through class discussion which develops questions and problems related to the social studies unit that might be answered at camp, and provides a return lead to your unit after camp. Examples of such questions and problems might be:

Unit on Latin America or Canada:

-Why have we been studying South America (or Canada)?

To learn about some of our neighbors

- How they live.
- What kind of country they live in.
- How they use the country to improve their living.
- How their present civilization grew out of the past.

We have some neighbors here in San Diego County that we do not know enough about. We will be going into their country when we go to camp. Who are these neighbors? (Indians) We have learned something about the Indians of South America. What do we know about Indians in San Diego County?

- Are they faced with the same kind of problems?
- Are they living in similar kinds of countries? How similar? How different?

Geography of the land
Weather and climate
Natural resources
Customs
Industries

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*Curriculum Guide--The Elementary Program, San Diego City Schools.

In comparing the two environments, a clearer understanding and deeper appreciation may be had of both.

Unit on transportation or on trade and transportation:

-About how long will it take us to make the trip to camp?

-How long by airplane?

-How long do you suppose it took the early Indians to get from the coast to the Cuyamaca mountains?

-How did they travel?

-When they came to trade, how did they carry their loads of goods?

-What kinds of roads did they use?

-How do the mountains affect transportation today?

Act as a barrier to and from the East

- Expense of highways
- Danger on mountain roads
- Air travel dangerous

-What important kinds of transportation are carried on in the mountains today?

Unit on communication:

-In what ways can we communicate with camp? (By phone)

-How could the Indians communicate from the coast to the mountains?

-How did the Indians communicate over shorter distances?

Smoke signals
Messenger
Sign language
Spoken word
Song
Written symbols
Color symbols
Dance
Drum signals

-How do the mountains influence communication today?

Hinder radio and television reception.
Provide peaks for radio relay stations, radar stations, aircraft warning and fire lookout stations.

Unit on man and the universe:

An excellent tie-in with the space unit is provided through the outdoor astronomy program. Experiences in learning about man's relationship to the universe include:

- A visit to the world's largest and most valuable instrument for studying stars and space - the Palomar Observatory.
- Observing various kinds of bodies moving through space.
- Viewing heavenly bodies through telescopes.

One of the basic purposes of the outdoor program is to help students understand their relationship to their environment. Their environment includes the universe of which their world is a part.

VII

HOW CAN THE TEACHER USE THE OUTDOOR EDUCATION PROGRAM TO IMPROVE SCIENTIFIC INVESTIGATION AND DISCOVERY?

The natural environment of the mountain area provides an outdoor laboratory that is uniquely suited for learning through scientific investigation. The outdoor laboratory:

Is real— It confronts the student with real situations.

Is here and now-- It promotes direct, first hand meaningful experiences.

Is action-centered--It invites active participation and learning by doing.

Reveals relationships-- Natural relationships and inter-dependencies can be studied in many stages of evolution and ecologic progression.

Invites exploration-- The new and unfamiliar natural areas must be explored in order to observe it closely.

Leads to new discoveries-- Exploring an unknown environment can lead to many new and unexpected discoveries.

Promotes a spirit of adventure and high motivation-- Exploring unknown places contains elements of uncertainty and pleasurable expectation which foster a spirit of adventure.

Stimulates inquiry-- It causes student to wonder and question about the things he observes in the new environment.

Expands awareness-- New experiences in new environments can cause children to become aware of new and varied interests and situations.

Offers opportunities for scientific investigation-- Observation, problem solving, gathering evidence (collecting), testing and experimenting.

Offers opportunities for conservation work experience-- Many of the problems of the environment can be partly solved through work by the students.

Instruction in the outdoor laboratory involves the use of the approach and methods of the scientist.
In using the discovery approach of the scientist, the teacher:

-Plans situations wherein students are confronted with elements and circumstances that are unknown.

-Encourages students to explore as individuals in the unknown.

- Promotes an intellectually adventuresome climate for exploring.

- Improves the skills and techniques of careful observation while exploring.

- Whets the appetites of students for discovering new things and ideas

- Promotes inquiring minds in students through his own example of questioning.

- Helps students understand the methods of investigation.

- Exemplifies inductive thinking to demonstrate differences from deductive thinking.

- Places the burden of thinking upon the students.

- Leads and guides the thinking of students toward greater insights.

- Helps students to identify and state problems that need to be solved.

- Refrains from answering questions and problems that might better be answered through discovery and investigation.

- Teaches students the skills and techniques of using scientific instruments.

- Encourages students to withhold judgements until they can be supported by investigation.

Science instruction at camp is related to the immediate natural environment in which the students find themselves. Investigation is concerned with questions and problems that grow out of exploration and observation in the outdoor laboratory.

There is need to promote discovery and investigation that is not confined to the outdoor education program. There is need to use the outdoor program to promote scientific investigation in the classroom.

USING THE OUTDOOR EDUCATION EXPERIENCE TO PROMOTE SCIENTIFIC INVESTIGATION AND DISCOVERY IN THE CLASSROOM

The classroom teacher should approach the outdoor experience as an opportunity to explore an unknown place. Through your own example, you can encourage a climate of adventurous exploring that can lead to many new discoveries.

Present the mountain environment as an outdoor laboratory that children can use to investigate questions and problems. (Refer to description of the outdoor laboratory.)

Discuss methods of discovery and investigation that the students might be able to use in the outdoor laboratory. Using the "discovery approach" the student:

- -Explores the unknown.
- -Observes carefully as he explores.
- -Inquires about the things he observes.
- -Investigates questions and problems to be answered and solved.
- -Does original thinking in investigating.
- -Proposes possible answers to problems (hypotheses).
- -Experiments and tests to check the proposed solutions.
- -Gathers information about problems (researches).
- -Collects evidence for further study.
- -Evaluates the findings.
- -Discovers generalizations.
- -Makes conclusions.

Survey the classroom study of conservation to identify questions that might be answered through investigation in the outdoor laboratory. Encourage questions that can best be answered by firsthand investigation. Examples of kinds of questions that might well be asked are:

-How are the mountains we see to the east of us important?

    To plants and animals
    To people

-In what ways are the mountains a natural resource?
-How is the mountain area different from where we live?

    Weather
    Topography
    Geology
    Plants and animals
    Industries and occupations

-How were the mountains formed?
-What kinds of forest trees are found in the mountain area?

    How and why are they important?
    What enemies attack the trees?
    How do trees grow?

-What is chaparral? How is it important?
-How do plants and animals help each other?
-What can we do at camp to help plants and animals?
-How is soil made? Where does it come from?
-Do the mountains supply any of the water we use? How?
-What happens to the rain that falls upon the mountains?
-How are streams and ponds important?
-How are the forest trees and chaparral protected from fire?
-In what ways does fire start?
-What can we do to help protect our forest resources?

N

Plan problem-solving approaches and make specific assignments for students to investigate and report back to class. Encourage students to add other questions or problems that they develop while they are studying at camp.

Have each student prepare a statement of the question or problem that he is planning to investigate at camp. Keep these statements on file or on display for follow-up action and research upon return to camp.

Encourage students to bring back to class any specimens that will help them to answer their question or solve their problem such as

-Cross section of log
-Examples of symbiosis
-Samples of pond or stream water
-Specimens of rocks or minerals
-Specimens of enemies of trees.

Encourage students to take pictures of situations to be presented as evidence in their investigation.

Invite students to make field notes and sketches at camp as a part of their investigation.

Alert the camp staff about the investigations being made.

Make notes and plans while at camp for improving and updating investigation projects.

Give individual guidance to students about their projects.

Supervise the collection of specimens to be returned to the classroom. Supplement with your own collection of specimens.

Provide opportunities for students to continue their investigations upon return to class. Plan for:

-Additional reference books.
-Display tables and materials.
-Tests and experiments.

Establish a means for reporting findings of investigation. Establish a:

-Format for written reports.
-Schedule for oral reports.

VIII

HOW CAN THE TEACHER PLAN TO USE OUTDOOR CONSERVATION EXPERIENCES IN TEACHING THE CONSERVATION UNIT?

The outdoor education program affords unique opportunities for learning about natural resources.

In order to use a natural resource wisely, it is necessary for us to learn about the nature of the resource:

-Its physical characteristics
-Its ability to renew itself
-Its behavior under varying circumstances
-Its relationships with other natural materials and forces
-Its relationship to man and his needs

We learn more effectively about natural resources through firsthand experiences with them.

Exploring and observing in the natural environment promotes in children a feeling of intimacy with nature. The smell of the soil and growing things, the sound of the busy forest community, the fresh beauty of nature's colors, and the feel of soft moss and rough bark promote a very personal relationship between the child and the natural world about him.

This feeling of intimacy leads to increased appreciation of the beauty and design in nature that results in a feeling of spiritual uplift. The child's concept of his natural heritage and his relationship to it should grow not only from intelligence, but also from strong emotional and spiritual feelings.

The local scene offers a basis for developing generalizations.

The natural resources of San Diego County and their problems of control, replacement and use are varied and representative of other areas. A consideration of the local scene should culminate in learnings and understandings that can be applied generally in guiding us to the wise use of natural resources.

The outdoor education program contributes to the development of important concepts of conservation and natural science.

Some of the concepts of conservation that may well be taught in connection with the school camp program are:

-All living things--man, animals, plants and the soil that supports them--are interdependent and interrelated with each other. Man is a part of this complex fabric and must adjust and control to promote those relationships that will benefit not only himself but also posterity.

-The relationships of everything that are a part of the natural environment tend to work toward a balance. This balance in nature is disturbed by man as he uses the natural resources. He must plan to encourage new relationships that are harmonious with his best interests.

- Some natural resources are inexhaustible. Air, water and sunlight are examples of resources that are generally inexhaustible but which in a local area may be found only in a limited supply.
- Some resources, such as soil and minerals, are exhaustible and only through wise and careful use can the supply be maintained.
- Some natural resources are renewable. Wildlife, forests and other plants are examples of resources that can be renewed.
- The beauty and esthetic value of the natural environment is in itself an important resource which must be cherished and guarded.
- In order to use natural resources wisely and still promote desirable interrelationships, it is necessary that man understand about the nature of the resources and their role in the natural environment.

Concepts grow and develop from ideas and understandings. Understandings are best taught in the field through direct experiences with the resources.

Some of the understandings of nature and science out of which can grow well-founded concepts of conservation are grouped in the following paragraphs under the subject headings Soil, Air, Erosion, Water, and Plants and Animals.

A. Soil

Soil is one of the most important of our natural resources. Without it man could not exist.

1. What is soil?

a. Soil is a mixture of rock particles together with decayed plant and animal materials called **humus**. In this mixture may be found many living things such as mold, bacteria and insects.

The kinds of soil can be classified into three main types: sandy soils, clay soils, and loams.

b. The layer of soil near the surface is called topsoil. Topsoil is more fertile than the subsoil beneath it.

c. The rock that lies under the subsoil is called bedrock.

d. At one time there was no soil. The solid part of the earth's surface was rock. The different kinds of rocks can be classified into three main groups:

(1) Sedimentary rocks are formed from sediment (mud, sand, gravel, rocks) that settles to the bottom in bodies of water where the weight of water and more sediment presses it into rocks after thousands or millions of years. Sandstone and shale are common sedimentary

MOHS' SCALE
TALC
GYPSUM
CALCITE
FLUORITE
MINERALS
BE SCRATCHED
THOSE UNDER
SCRATCHED BY A KNIFE;
OVER
WILL SCRATCH GLASS

Learning about rocks and minerals

(2) Igneous rocks are formed from hot molten lava that has cooled, sometimes rapidly and sometimes slowly. Granite and quartz are common igneous rocks.

(3) Metamorphic rocks are formed when sedimentary and igneous rocks are changed by great heat and pressure.

2. How is soil formed?

   a. The process of change in rocks caused by exposure to the weather is called weathering. Weathering changes rocks in many ways:

- Gases and acids from the air combine with minerals in the rock to soften and loosen particles.
- Water flowing over rocks dissolves some of the minerals and carries them away.
- Water seeps into cracks and freezes. The expanding ice forces the cracks wider and breaks the rock into smaller pieces.
- Differences in temperature between the outside and inside of rocks cause them to crack.

b. Plants and animals also help to break rocks.

- The roots of plants as they grow larger break up rocks.
- Animals and insects burrow in the soil and bring water and chemicals to the bedrock.
- Plants (lichens and mosses) growing on rocks weaken the surface structures.

B. Air

Air is a natural resource that is often overlooked because we take it too much for granted. There could be no life without air.

1. Air is a mixture of oxygen, nitrogen, carbon dioxide, water vapor and many other kinds of gases that are essential to life. Air also contains many particles of dust and other solids.

2. Air occupies space. It can move from a particular space but it cannot leave a void or a vacuum where it was. Other air moves in to occupy the space.

3. Air can expand and contract. It may become very thin or it may be compressed.

   - Air expands and becomes lighter in weight when it is heated.
   - As air rises it cools.

4. Air flows like a fluid. Light, warm air tends to rise above heavy, cool air, while cold air settles to the ground.

5. Air is heated unevenly over the surface of the earth because of the rotation of the earth, and topography, and because of the difference in materials that cover the surface of the earth. As air is warmed, it expands and rises to cause surface wind as cooler air moves to where the warm air was.

6. The amount of water vapor that air can hold depends upon the temperature of the air.

   a. When air holds as much water vapor as it can, it is saturated.

   b. The warmer the air, the more water vapor it can hold before it becomes saturated.

c. The temperature at which air becomes saturated with water vapor is called the dew point.

d. When air is cooled below the dew point, water vapor condenses (changes to liquid) on dust or other particles in the air to form rain.

7. As rain falls through the air, it dissolves some of the carbon dioxide gas from the air to form a weak carbonic acid. This acid helps to dissolve some of the minerals of the earth.

8. Some of the gases of the air are used by plants and animals. These gases are later returned to the air. The oxygen-carbon dioxide cycle is one example of how gases are used, changed to new gases, recombined and used again.

C. Erosion

In many parts of our country, soil is being transported from the surface of the land faster than it can be made.

1. Water and wind are the two main causes of soil erosion.

2. Water causes two different kinds of erosion:

    a. Sheet erosion, where water wears away the topsoil in thin layers. Sheet erosion may cover wide areas.

    b. Gully erosion, where concentrated running water digs gullies as it flows to lower levels. Gully erosion often follows sheet erosion.

3. Factors affecting soil erosion are:

    a. The amount of rain that falls.

        -It is not always true that the greatest erosion is found where there is the greatest amount of rainfall.
        -Large amounts of rain distributed evenly will usually result in a heavy growth of plants that will protect the soil.
        -In regions where there is usually little plant covering because of little rain, there may be a great deal of erosion caused by sudden, severe cloudbursts.

    b. The steepness of the slope of the land. The steeper the slope, the faster water will flow downhill. The faster water flows, the more power it has to cut and carry soil away.

    c. The kind of ground covering.

        -When drops of water fall upon bare earth, the force of impact of the drops act like many tiny hammers pulverizing the earth. This loosened soil is washed away rapidly by the rain.

-A ground covering of green plants provides many leaves which act like tiny umbrellas to cushion the force of the falling drops and allows them to roll or fall lightly from the leaf to the ground.

d. The kind of soil.

-Some soils are course and porous and allow the rain water to seep readily below the surface to become underground water.
-Some soils are cemented together with enough clay to resist erosion.
-Loose topsoil is often washed away readily.

e. The speed of the wind. The effect of the wind as an eroding agent depends upon some of the things that influence water erosion. In general, there is greatest wind erosion when the wind is strong, there is no protecting vegetation, and the soil is loose and dry.

D. Water

Water is of the utmost importance to living things because they are made up largely of water. About three-fourths of the human body is water.

1. Water is a combination of the two gases, hydrogen and oxygen.

2. It possesses the following very important characteristics:

a. It is found in three states--solid, liquid, or gas.

-It is in the solid state when it is frozen as snow or ice.
-It is in the liquid state when you can drink it or pour it.
-It is in a gaseous state when it is water vapor.

b. Water changes readily from one state to the other under certain conditions.

-Water changes from a visible liquid in pools, streams and oceans by evaporation to become invisible water vapor in the air.

-The water vapor (gas) in the air changes (condenses) into tiny drops of liquid that may float in the air as a part of a cloud.

-The tiny droplets may grow larger until they become heavy enough to fall (precipitate) as rain. Some of the falling rain will again change to vapor and some may change to hail or sleet.

-If it is cold enough, the water vapor will condense as snow crystals and precipitate as snow.

-The rain water may flow downhill or seep into the ground.

-The falling snow may remain in the solid state or melt to behave as rain water.

c. As a liquid, water responds to the laws of gravity: it flows downhill, it seeps or percolates down through materials, and it falls through the air.

d. Water has weight and when moving exerts a force that tries to move things. The faster water moves, the greater force it has to move things and the greater load of soil it can carry in suspension.

e. Water dissolves more different kinds of minerals than any other liquid. Water is able to transport dissolved materials in solutions. Water which contains calcium and magnesium minerals in solution is sometimes called hard water. Many minerals dissolved in water finally become a part of the salty ocean solution.

E. Plants and Animals

All living things are either plants or animals. Living things have the following characteristics: they need food, they breathe, they grow, they reproduce themselves, and they adapt to their environment.

1. Food

a. Green plants manufacture food in the presence of sunlight by combining carbon dioxide from the air and dissolved minerals from the soil.

-The food is manufactured chiefly in the leaves.
-The green coloring material is called chlorophyll.
-The process of food making is called photosynthesis.
-The manufactured food is stored mainly in the stems and roots.

b. Plants that are not green cannot make their own food and so depend upon other green plants. These are the mushrooms, molds, yeasts, bacteria and other fungi.

c. Some plants use the food that green plants have already made by taking it from the living plant (parasites).

d. Some plants use the food from plants that have died (saprophytes).

e. Some plants manufacture their own food but rob moisture and minerals from the living plants (mistletoe).

f. Some plants cooperate together to get food. Lichens are a union of algae and fungi and exist by a process called symbiosis.

g. The green plant, in manufacturing food, releases the very important by-product of oxygen into the air at the same time it uses carbon dioxide from the air.

h. Every living thing is dependent upon other living things for food in an endless chain. Rodents eat plants; birds of prey eat rodents; large carnivores eat small carnivores. Insects, plants and bacteria consume all dead things to provide food in the soil for plants which are the foundation for the great pyramid of living things.

2. Breathing (respiration and transpiration)

   a. All animals breathe in oxygen and breathe out carbon dioxide. This process would, in time, remove the oxygen from the air and replace it with carbon dioxide except for the fact that in food making, the green plants keep the air balanced by using carbon dioxide and giving off oxygen.

   b. Living things return much of the water they use to the air.

   c. In plants this process is called transpiration.

3. Growth

   a. All living things are composed of cells that multiply to form tissues, organs and systems that can be identified as particular plants or animals.

   b. There are many different kinds of plants and animals. They can be classified in many different ways.

   c. Plants may be grouped according to the method of reproduction.

   -Plants which reproduce by spores are:

   Bacteria including blue-green algae
   Algae including green, yellow-green, brown and red forms
   Slime molds
   Fungi including molds, mildews, yeast, rusts, lichens, and mushrooms
   Mosses including liverworts
   Ferns including horsetails

   -Other plants produce seeds, flowers and fruit. Every part of a seed-producing plant has a particular function:

Roots anchor plant, store food, provide a means of assimilating moisture and minerals.
Stems support plant, transfer food, minerals and moisture between leaves and roots, store food and water.
Leaves manufacture food, provide an area for carrying on respiration and transpiration.
Flowers develop fruit and seeds for reproduction of species.

d. Animals are classified into many groups according to structure and habits. All animals can be included in two large groups.

-Vertebrates (those having a backbone)
-Invertebrates (those without a backbone)

4. Reproduction

a. Living things are able to reproduce their own kind.

-Plants produce offspring in various ways. The simplest plants reproduce by dividing or budding.

-Spores differ from seeds in that they do not have stored food to start the plant growing.

-Spores are produced in great numbers and depend on the wind to carry them to a suitable environment. Most spores die.

b. Seeds always contain enough food to produce a young plant until it can grow roots.

c. All flowering plants produce seeds.

d. To produce seeds it is necessary for pollen from a flower to fall on the egg cell of a flower (pollination).

e. Plants are pollinated in many ways:

-Self-pollination. (The flower fertilizes itself. Flowers are unattractive with little scent.)
-Cross-pollination. (Two separate flowers are required.)
-Pollen carried by wind.
-Pollen carried by insects. Flowers usually brightly colored with pleasant odor. Insects carry pollen on back and legs.

f. Seeds are transported in many ways:

-Birds and other animals spread seeds in droppings.
-Wind carries seed that is especially equipped with sails--parachutes.
-Cones, acorns, etc., drop and roll downhill.
-Pods burst open with explosive force.
-Seeds with claws hook onto fur of animals.

g. Animals reproduce in various ways:

- Simple animals produce just as simple plants do by dividing or budding.
- The young of some animals are hatched from eggs.
- Eggs must be fertile to hatch. They must contain two cells, the male sperm and the female ovum.
- Eggs are similar to seeds.
- The young of some animals grow inside the body of the mother.
- Animals generally have fewer offspring than plants have seeds.
- Animals that produce fewer young need to have greater protection.

5. Adaptation

a. Living things compete in a struggle for existence.

b. Their survival depends upon their ability to adapt to their environment. The environment or habitat of living things is composed of many segments:

- Extremes of temperature,
- Amount of moisture.
- Intensity of sunlight.
- Topography.
- Soil conditions.
- Elevation.
- Kinds of surrounding plants and animals.

c. In their struggle to survive, living things have adapted themselves in many ways to their environment. Plants adapt themselves to climate through the following:

- Shape and size of leaves to reduce evaporation.
- Varnishes and other coverings to reduce evaporation
- Extensive root systems.
- Elaborate storage systems.
- Devices to increase tolerances to shade and sunlight.
- Ability to become dormant and loose leaves in winter.

d. Animals adapt to climate in many ways.

- Covering of hair or fur in cold climate.
- Ability to perspire for cooling in warm weather.

e. Animals adjust themselves to seasonal changes.

- Migration (moving to a warmer climate).
- Hibernation (sleeping with decreased body functions).
- Metamorphosis (changing into a different form).

f. Animals adapt to other living things.

- Development of characteristics that attract, such as, color, odor, taste, form.
- Development of cooperative relationships that are beneficial:

  Insects - flowers (food, reproduction)
  Birds - fruit (food, reproduction)
  Squirrels - nuts (food, reproduction)
  Algae-fungi - symbiosis (food, water)
  Photosynthesis - respiration (balance of gases)

g. They adapt for protection:

- Protective coloring
- Bitter or acid taste
- Repulsive odors
- Irritants and poisons
- Spines
- Armor
- Speed of movement
- Claws, teeth for fighting
- Immobility
- Machinery for digging escape routes

h. Environments where plants and animals live together in balance are called communities. There are many different kinds of plant-animal communities.

Only certain plants and animals can be expected to be found in each community:

- Evergreen woods
- Deciduous community
- Field community
- Meadow community
- Swamp community
- Pond community

i. When plants and animals are not able to adapt to their community, they must move or die out.

- No plant or animal can exist independent of other living things.
- Man must be careful in reshaping his environment so that he will not upset the balance in life communities to his own long-range detriment.

The outdoor education program provides a laboratory for the sixth-grade social studies unit on conservation.

The teaching of certain of the learnings of the conservation unit may be timed so as to prepare for conservation experiences that are a part of the outdoor education experiences.

Outdoor conservation activities contribute to desirable attitudes and learning.

A summary of some of the kinds of outdoor experiences that contribute to the development of desirable attitudes and learnings at camp are:

- -Hiking to explore and observe natural resources.
- -Listening to nature talks.
- -Studying nature and exhibits in the camp museum.
- -Learning and abiding by rules and regulations of the State park system and the United States Forest Service.
- -Practicing good conservation procedures--good sanitation in forests and streams and lakes, picking up litter, etc.
- -Using our resources wisely--following good thrift and conservation principles in collecting craft materials.
- -Working to improve and help our natural resources.

The outdoor education program affords unique opportunities for conservation work experience.

The natural environment of the outdoor experiences of the camp program affords a setting that is conducive to working to improve natural resources. When children feel the dramatic impact of life and death struggles in nature that are revealed to them in stark reality, when they see the ugly scar of erosion in the meadow or the discoloring fade of drying trees in the forest, they become eager to have some part in helping to solve the problems confronting the natural resources of our land.

When children work to improve the land, they give of themselves to a cause that they feel is worthy of their efforts. Each bead of sweat and each blister raised in nature's behalf become badges that link children more closely and more personally with the problems of the land. As children identify themselves with a worth-while project, they feel a satisfaction that leads to continued interest in problems relating to the conservation of natural resources.

PRE-CAMP PLANNING

A summary of outdoor conservation work experiences is presented in Chapter I of this guide. Detailed descriptions of most of the conservation activities are contained in Outdoor Education: A Guide to the Instructional Program at Sixth-grade School Camps.

Pre-camp planning prepares the students to make more effective use of the outdoor education experiences. What conservation learnings should we know before going to camp? There are certain learnings that the classroom teacher can plan for in pre-camp experiences that will help the students to be better prepared for the laboratory experiences at camp. Some of these learnings are suggested in the following questions:

- -How does a tree grow?

HOW A TREE GROWS
FROM TREES TO HOUSES
TREES TO HOUSES

Learning about trees before going to camp

-What are the important parts of a tree and how do they work together?

-How do leaves manufacture food?
(The principle of photosynthesis should be understood.)

-What is the water cycle? What are the principles and natural forces that are involved?

-What is the influence of the mountain range upon the weather in our country?

Going-to-Camp Discussions

Going to a new place develops interest in learning more about that place and what might be found there. Class discussions about going to camp can be used to make a good approach to the conservation experiences that are a part of the camp program.

What is the mountain area like?

Where is camp ___________? How do we get there?

Encourage children to bring an automobile highway map to study. This is an excellent opportunity to study maps and the story they tell.

- Scale of miles
- Types of roads to be traveled
- The route the bus might follow
- Some interesting things to see along the way (Refer to itinerary of bus trip.)
- Highway numbering system
- Letter-number grid location system

Is the mountain area different from the area here? How? Why?

Different in elevation (4,000 - 6,500 feet high).

- Extremes of temperature, cold
- Increase in rainfall--why? (Air forced up and cooled by mountains)

Different kinds of plants because of differences in temperature and moisture.

- Evergreen trees, needles
- Mosses, fungi, lichens
- Chaparral plants

Water in streams and lakes.

More weather in the making--clouds, storms, lightning, thunder, wind.

Difference in soil and rocks--mainly igneous rock instead of sedimentary.

Interesting topography--mountains, valleys, canyons, meadows, mesas (the sharp cutting of water in areas that have been lifted by mountain-making forces).

Views of great distances from high places.

Thin air, little oxygen in high elevation.

Distance from ocean

- Drier air at times
- Extreme temperatures--below zero at times

Is the mountain region where the camp is located important to us? How? Why?

A source of water supply

- -Effect of mountain range on rainfall.
- -Headwaters and watershed of local river systems.

Source of soil (soil from mountains has washed down and partially filled in rich valleys and bays)

A recreation area

- -Mountain playground: fishing, hiking, snow sports, beauty, rest.
- -Desert playground: mountains cause the desert which is in the "rain shadow."

Are we important to the mountain area? How? Why?

Destructive use of the area

- -Start forest or brush fires.
- -Chop down or deface trees.
- -Destroy wild flowers and other plants.
- -Leave unsightly and trashy evidence that we have been there.

Wise use of the area

Do all we can to prevent fires.

- -Learn and abide by rules and regulations that have been established.
- -Inform or remind others of rules.

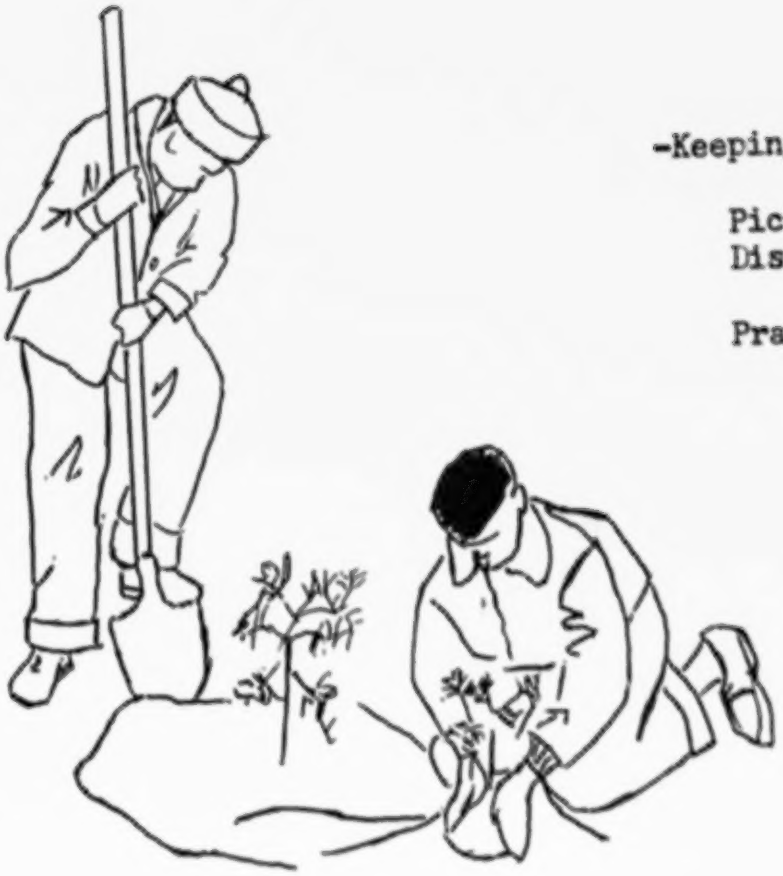
Try to improve the area

-Helping to control soil erosion.

Building check dams and plugs.
Planting willows.
Plant cover crop.

-Reforesting the area.

Gathering seeds, planting and maintaining a nursery.
Transplanting seedlings.



-Keeping the area beautiful.

Picking up unsightly trash.
Discouraging any unnecessary marking of trees.
Practicing good forest manners.

-Protecting the living things.

Carrying on bird and animal feeding projects.
Discouraging trapping and molesting of birds and animals.
Helping trees in their fight against insect enemies.

Felling a tree in order to control the beetles that have killed it

What are some of the things we might see in the mountain area?

Common trees of the mountain region:

Incense cedar
Jeffrey pine
Coulter pine
Ponderosa pine
Sugar pine
Big cone spruce (Palomar)
White fir
Black oak
Coast live oak
Canyon live oak
Alder
Willow

Chaparral (brush and dwarf trees) of the mountain region:

Manzanita
Red shank
Scrub oak
California lilac
Wild cherry
Mountain mahogany
Poison oak
Chamise (greasewood)
Wild buckwheat
Cascara Sagrada

Flowers of the mountain region (spring):

Lupine
Scarlet bugler
Yucca
Tidy tips
Red bud
Multicolored penstemon
Wild peony
Monkey flower
Wild rose
Indian paint brush
Wall flower

Birds of the mountain regions:

Meadowlark
Blackbird
Red-tailed hawk
Buzzard
California blue jay
Stellar jay
Scarlet tanager
Owl
Mountain quail
Wild pigeon
Morning dove
Crows

Hikers
pause
to
study
birds

Animals of the mountains:

- Deer
- Coyote
- Mountain lion
- Grey fox
- Wildcat
- Racoon
- Skunk
- Squirrel
- Gopher
- Beaver
- Chipmunk
- Woodrats

Snakes and lizards of the mountains:

- Gopher snake
- King snake
  - Mountain coral
  - Pacific banded
- Rattlesnake (This is the only dangerous snake in the mountain area. Other snakes will bite and cause pain but have no poison to inject. All bites should always be treated to prevent infection.)
- Garter snake
- California boa
- Horned toad (lizard)
- Western skink (lizard)

Common rocks and minerals of the mountains:

Igneous:
- Granite
- Pegmatite
- Quartz
- Feldspar
- Tourmaline
- Mica
- Shale

Sedimentary:
- Clay
- Sandstone
- Gypsum alabaster (brought from desert mountains)
- Shale

Metamorphic:
- Schist
- Soapstone (steatite, talc)
- Quartzite (sandstone changed by pressure)
- Gneiss (granite changed by pressure)

What is the weather like at camp?

Some interesting kinds of weather--snow, hail, rain, fog, clouds, wind:

-What causes it? What is it like?
-How is it helpful?
-How is it harmful?

There is more precipitation in the mountains than near the coast. Why?

What happens to the moisture that falls?

-Plant growth -Subsurface
-Evaporation -Runoff from watershed

How do we capture precipitation to use?

Dams intercept streams and store water until needed.
Windmills and other pumps tap underground reservoir.

How can we measure the weather at camp?

Temperature - thermometers (maximum - minimum)
Relative humidity - sling psychrometer
Air pressure - aneroid barometer at camp
Wind direction - weather vane
Wind velocity - estimate, Beaufort scale, anemometer
Fuel moisture (approximate moisture of plant growth covering the hills)--fuel moisture stick at camp

How can we determine the fire hazard at camp? (Consider the above factors. Summarize and evaluate.)

Bus Trip Itinerary

The bus trip to camp can be developed into a very valuable field trip for firsthand observation of some of our natural resources and the way they influence the lives of many people in our country.

Prepare for the trip by planning with students some of the interesting things to look for. Display and study the set of study prints "The Trip to Camp" (in camp kit).

Develop an itinerary as a guide for the trip.

Draw a large pictorial map of the route to camp with illustrations of pertinent things to observe. Plan for additional items of interest observed along the way to be added to the map as a post-camp activity.

Some points of interest and questions to be considered might be found in the descriptions of areas through which the bus will pass. The following list is an example of itineraries that might be prepared. The list may suggest other points of interest that might be observed along different bus routes.

Near Mission Bay (Development of the bay as a recreation area)

What was the chief problem in developing the bay for beauty and recreation? (Dredging mud)

Where did the mud come from (Mission Valley and other smaller valleys)

How was the mud carried? (San Diego River)

Why don't we have floods today such as we used to have? (Dams and reservoirs to control and store runoff)

What provisions have been made to prevent further silting and filling in of the bay? (San Diego River floodway)

> At one time Point Loma was an island. The mud from the San Diego River filled in the water-covered area which is now Midway. At one time the San Diego River flowed into San Diego Bay and threatened to fill it with silt until engineers redirected the flow of the river from San Diego Bay to Mission Bay.

Presidio Hill--site of early Spanish and Indian battles

Presidio Museum--interesting display of early Indian and Spanish activities

Mission Valley--San Diego River

"Upside down" river--water runs underground.

During floods in the past it washed out bridges at Ward Road and flooded the whole valley.

Early Indians and Spaniards dug wells for their water in Mission Valley. Later they moved upstream to present site of San Diego Mission. Locate the mission.

They went still farther up the river to build the dam for water at the mission. The Padres' Dam may still be seen in Mission Gorge.

The water that once ran out to the bay is now captured by dams: Cuyamaca, Capitan, San Vincente, and Murray. These dams are all a part of the San Diego River water system which begins at Cuyamaca.

What caused Mission Valley to be formed? (San Diego River carrying rain water down from the mountains)

Where are the soil and the rock that used to fill the valley? (In San Diego Bay, Mission Bay, filling in between the bays to form the land where Midway is at present.)

Is the soil in the valley fertile? What makes you think so? Why is it fertile?

What kind of crops are growing in the fields?

Along the banks where the road cuts through the hills

What do the rocks look like? Are they jagged and sharp or round and smooth? If round and smooth, how did they get that way? (By action of streams and ocean)

Are they in layers like the layers of a cake? Why?

Near San Diego State College or Miramar

Look back over San Diego toward the ocean. Notice that the tops of the hills and mesas on which the city is built are approximately of the same elevation. (At one time the whole area was under water. As this ocean bed was raised, streams cut valleys that separated mesas and formed hills.)

Look for ocean terraces slightly raised and nearer the foothills.

Keep looking at the road cuts and notice when the material is no longer cobblestone or sedimentary.

Have you noticed much soil on the tops of the mesas?

What kind of material do you find in the road cuts now? (Granite)

Along the highway through hills and valleys

Notice the small farms and ranches along the way.

What crops do they grow? Can you name each crop you see?

From where do the farms get their water? Can you see a part of the water system? (Windmills, pumps, storage tanks, dams)

> Many farms depend upon the great underground reservoir of water that is fed by seepage of rain and snow down through the soil. This water moves underground to lower levels. During long dry periods the water table is lowered so that wells must be dug deeper. Sometimes the water disappears and the farmers must move.

What is the source of much of the underground water? (The neighboring mountains)

What if there were no mountains in the back country?

What natural resources are these farmers and ranchers using? (Soil, water, sunlight, mineral fertilizers) Do they appear to be using their natural resources wisely?

Can you see any evidence of how people in our back country are using their resources unwisely? (Forest or brush fire, erosion)

What kinds of native plants are growing on the hills? (Brush or chaparral)

> Chaparral is from the Spanish word "chaparro" which means midget or dwarf and refers to the dwarf oak (used by the Indians for food) which is a common plant of the chaparral group.

Up in the higher hills and mountains

Notice that the kinds of plants are different as we travel farther and higher into the mountains. What kinds of new plants do you see for the first time on this trip? (Live oak, black oak, alder, cottonwood, poplar, pines, cedars, firs)

What birds and animals do you see for the first time on this trip?

Do you notice any change in the weather?

While you are at camp this week, you will get to know much more about the mountains and the life that is a part of the mountains. It may be that you will be able to answer some of these questions more completely after you return from camp.

POST-CAMP CONSERVATION ACTIVITIES

Post-Camp conservation experiences grow from two sources:

-Out of pre-camp planning

In general, the post-camp classroom experiences in conservation will grow out of the planning that was done before going to camp. Many problems and questions that were posed by students and displayed on the blackboard or bulletin board will greet the returning group with a challenge to use their camp experiences in solving the problems or answering the questions.

-Out of at-camp experiences

Some of the activities at camp are designed specifically to further post-camp experiences:

-The materials that have been collected in the outdoor education program can be arranged in effective displays for further study.
-Experiments discussed at camp can be conducted in classroom.
-Other ideas will be included in Conserving Our Nation's Resources.

IX

HOW CAN THE SIXTH GRADE TEACHER HELP TO IMPROVE THE OUTDOOR EDUCATION PROGRAM?

The current outdoor education program has developed and grown as a result of the careful thinking and evaluation by many persons.

TEACHERS' EVALUATIONS

One continuing source of guidance is given to the program through the evaluative comments made regularly by participating teachers. These comments are solicited in several ways:

1. The weekly conference with teachers

   On the morning of the last day at camp the classroom teachers meet with the principal or the head counselor to discuss reactions to the program and suggestions for improving the program. Pertinent suggestions are referred to either the camp staff for consideration or the outdoor education Advisory Committee for further study.

2. Post-camp correspondence

   Some aspects of the outdoor education program cannot be adequately evaluated for some days or weeks following the encampment. Many helpful comments have been sent to camp via the school mail. Some of the most helpful post-camp contributions have been in the form of lesson plans or materials describing certain successful classroom follow-up projects.

3. District-wide evaluation

   As the need arises, a district may conduct an evaluation of its total outdoor education program. Such evaluations may involve questionnaires or general meetings of sixth grade teachers of the district.

PARENT REACTIONS

Districts are always interested in parent reactions. One of the most effective means of providing parents with a basis for evaluation is to encourage the students to present a post-camp culminating program in which the parents are invited to share the student's enthusiasm in skits, displays, demonstrations and singing.

It is good planning to give a special invitation to parents of fifth grade children to attend the assembly. This introduction to the outdoor education program will serve as good background for the parents when their sixth grade child will be eligible to take part.

STUDENT PARTICIPATION

1. The last powwow

An informal evaluation of the students' participation in the program is conducted on the last night at camp by the children themselves in a final powwow. Actually these meetings result in more than evaluation alone, but the observing teacher will gain much insight into the child's thinking about the outdoor education program.

2. The "Woodquiz Scramble"

When time allows on Friday, a "Woodquiz Scramble," or scavenger hunt with a nature theme is conducted as an informal test of the students' knowledge about some aspects of natural science.

TESTS

Questions about the concepts and facts learned in the outdoor program can serve to help clinch or summarize the information learned at camp.

A list of questions that relate to outdoor learnings is included here for the teacher's use. Selected questions may be used in discussion or they may be presented as a written test. The list covers many aspects of learnings and consequently is too comprehensive to be presented in completed form. Questions covering those aspects of the program in which the students participated should be selected from the general list and given to the students in either oral or written form or in a combination of both.

WHAT DID YOU LEARN

(Answers to most of these questions can be found in Chapter VII)

About air and the weather

1. What is weather?
2. How is weather measured?
3. What instruments are used to measure weather?
4. What is air?
5. What is wind?
6. Why isn't the oxygen in air used up as plants and animals breathe it?
7. Why doesn't the air become filled with the carbon dioxide we breathe out?
8. Why is there more rain in the mountains than near the coast?

9. Why are there deserts to the east of the mountains?

10. Why does it get colder in our county mountains than in our lowlands?

About soil, rocks and minerals

1. What is soil?

2. What are the three main groups of rocks?

3. How is a mineral different from a rock?

4. How is rock changed to soil?

5. What is a soil profile?

6. How do the following help to make soil: air, water, temperature, plants, animals, and insects?

7. Where do the minerals in our bodies come from? How?

About erosion

1. What is erosion?

2. What are the chief causes of erosion?

3. How does vegetation covering the ground help to prevent erosion?

4. Does water cause erosion at a faster rate when it runs over steep slopes or over level land? Why?

5. How do rodents contribute to erosion?

About water

1. What is water?

2. Water is found naturally in three forms or conditions. What are they?

3. It is said that the ocean contains many minerals. How did they get there?

4. What is the "water cycle"? How does it operate?

About plants

1. How do green plants get food?

2. Why are leaves important to plants?

3. How do roots help plants?

4. How does the trunk or stem help plants?

5. How do flowers help plants?

6. Do plants breathe?

7. What causes the "annual growth rings" that can be seen on a fresh tree stump?

8. How do trees prepare for winter?

9. How do plants in the mountains help us get a drink of water on the farms?

10. How do plants help animals? Birds? Insects?

11 Why do plants need animals? Birds? Insects?

12. How do plants reproduce themselves?

13. What is a lichen? How does it get food, water?

14. How do mushrooms, molds, and other fungi get food?

About animals

1. What is an animal?

2. What is meant by a "food chain"?

3. What is meant by "balance in nature"?

4. In what ways are animals able to protect themselves naturally?

5. Could animals exist without plants? Explain.

6. How are leaves helpful?

7. Can trout hear? See? Smell? Drown?

8. How are snakes helpful?

9. What are the four stages of the life cycle of an insect?

About geography

1. In what mountains is our camp located?

2. What is the name of the larger range of mountains in which all three school camps are located? (Peninsular Range)

3. What is a watershed?

4. What is a divide?
5. What is a mesa?
6. Why do we find different kinds of plants and animals at different elevations?

About the heavens

1. What is a planet?
2. What is a star?
3. What is a satellite?
4. What is a nebula?
5. What is a constellation?
6. What is a galaxy?
7. What is a light year?
8. What causes night? Day?
9. Why is the 200-inch mirror of the Palomar telescope made of Pyrex glass?
10. What is the purpose of the mirror in the telescope?

X

HOW CAN THE TEACHER PROVIDE FOR PUPILS WHO DO NOT GO TO CAMP?

Children who do not go to camp should not be penalized. A carefully planned program for them should be developed that is in keeping with the objectives of the outdoor education program.

The number of children remaining at school will influence the kinds of activities that will be possible. Further experimentation is needed to explore the possibilities of a principal, a vice-principal, a substitute teacher, or a regular classroom teacher with a small group taking the combined group of "left-overs" for some of the suggested activities.

Some of the kinds of experiences that might be engaged in are:

-Doing useful work

  To improve the classroom or school.
  To be of service to the community.

-Conserving resources

  Planning and carrying on projects to prevent soil erosion on the school grounds or in the community.
  Planting a tree, flowers, shrubs, or garden (See science resource guide.).

-Exploring the environment. Encourage parents to take their children on field trips to:

  Torrey pines
  Scripps aquarium and museum
  Bird Rock tide pools
  Various museums
  Zoo
  Harbor

-Using the environment for creative self-expression

  Engaging in arts and crafts.

    Shell craft
    Drawing scenes from life (ocean, cliffs, trees)
    Soap carving
    Activities that are different from those usually done in the classroom

  Dramatizing some of the incidents arising from field trips.
  Learning new dances, songs and games.
  Seeing interesting films.

-Planning picnics, parties, programs and other sociable activities

-Planning ways of using the experiences for those who do not go to camp to motivate the regular post-camp instructional program

Those who do not participate in the outdoor education program should have many interesting experiences to share with those who go to camp. The sharing should involve everyone so that there is less of a feeling of being left out.

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Curriculum Guide: The Elementary Program. San Diego City Schools, 1950.

Kidd, Leonard S. Conservation: A World Problem. San Diego City Schools, 1964.

The Camp Kit

The Camp Kit is a collection of bulletins, monographs, maps, study prints, and colored slides covering such fields as natural science, history of the area, Indian culture, music, art, and the school camp program. The kit is distributed several weeks before the encampment by a district truck. It is normally available for one week following the encampment.